Exhibit A

Certificate of Registration

This Certificate issued under the seal of the Copyright
Office in accordance with title 17, *United States Code,*
attests that registration has been made for the work
identified below. The information on this certificate has
been made a part of the Copyright Office records.

Kay A. Tugle

Acting United States Register of Copyrights and Director

Registration Number

TXu 1-795-146

**Effective date of
registration:**

April 3, 2012

Title

Title of Work: AirOS 5.2.1

Completion/Publication

Year of Completion: 2010

Author

■   Author: Ubiquiti Networks, Inc.

Author Created: computer program

Work made for hire: Yes

Citizen of: United States   Domiciled in: United States

Copyright claimant

Copyright Claimant: Ubiquiti Networks, Inc.

91 E. Tasman Drive, San Jose, CA, 95035, United States

Limitation of copyright claim

Material excluded from this claim: computer program, Previous versions and licensed-in materials

New material included in claim: new and revised computer code

Certification

Name: Jessica Zhou, Ubiquiti Networks, Inc.

Date: April 3, 2012

Applicant's Tracking Number: 70730-50001.00

Registration #: TXU001795146

Service Request #: 1-747770041

Morrison & Foerster LLP
Jennifer Lee Taylor
425 Market Street
San Francisco, CA 94105-2482 United States

Additional Certificate (17 U.S.C. 706)

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Acting United States Register of Copyrights and Director

Registration Number

TXu 1-795-147

Effective date of registration:

April 3, 2012

Title —————————————————

Title of Work: AirOS 5.3

Completion/Publication ——————————

Year of Completion: 2011

Author ——————————————————

Author: Ubiquiti Networks, Inc.

Author Created: computer program

Work made for hire: Yes

Citizen of: United States   **Domiciled in:** United States

Copyright claimant ——————————

Copyright Claimant: Ubiquiti Networks, Inc.

91 E. Tasman Drive, San Jose, CA, 95035, United States

Limitation of copyright claim ——————

Material excluded from this claim: computer program, Previous versions and licensed-in materials

New material included in claim: computer program, New and revised computer code

Certification ——————————————

Name: Jessica Zhou, Ubiquiti Networks, Inc.

Date: April 3, 2012

Applicant's Tracking Number: 70730-50001.00

Page 1 of 1

Registration #: TXU001795147

Service Request #: 1-747770159

Morrison & Foerster LLP
Jennifer Lee Taylor
425 Market Street
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Exhibit C

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Legal Documentation

Terms of Service

EULA

Privacy Policy

Limited Warranty

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b. **Government Purposes.** The Software was developed solely at private expense and is a "commercial item" consisting of "commercial computer software" and "commercial computer software documentation" within the meaning of the applicable civilian and military Federal acquisition regulations and any supplements thereto, as amended from time to time. If the user of the Software is an agency, department, employee or other entity of the United States Government, consistent with 48 C.F.R. 227.7202-1 through 227.702-4 (JUNE 1995), the use, duplication, reproduction, release, modification, disclosure and transfer of the Software, including technical data or manuals, is governed by the terms and conditions contained in this EULA.

c. **Severability.** If any of the provisions, either in part or in full, of this EULA is held by a court or other tribunal of competent jurisdiction to be unenforceable or invalid, such provision shall be enforced to the maximum extent possible or permissible and this EULA will be interpreted so as to give maximum effect to the original intent of the parties with respect to the unenforceable provision, and the remaining portions of this EULA shall remain in full force and effect.

d. **Assignment.** You may not assign any of Your rights or obligations under this EULA without Ubiquiti's express written consent. Ubiquiti may assign this EULA without Your consent provided that such assignment is to an affiliated company forming part of the Ubiquiti group of companies.

e. **Waiver.** The waiver by either party of any default by the other party shall not waive subsequent defaults by such other party of the same or different kind. The failure of either party to enforce the provisions hereof, at any time or for any period of time, or the failure of either party to exercise any option herein, shall not be construed as a waiver of such provision or option and shall in no way affect that party's right to enforce such provisions or exercise such option.

f. **Third Party Beneficiary.** Licensors and suppliers of Ubiquiti and its affiliates are third party beneficiaries of this EULA, and thus this EULA is directly enforceable by such licensors and suppliers and their affiliates.

g. **Statute of Limitations.** You agree that regardless of any statute or law to the contrary, any claim or cause of action You may have arising out of or related to use of the Software or this EULA must be filed within one (1) year after such claim or cause of action arose or be forever barred.

h. **Interpretation.** As used herein, unless the context requires otherwise, the word "or" is not exclusive and the words "will," "will not," "shall," and "shall not" are expressions of command and

not merely expressions of future intent or expectation. Whenever the words "include," "includes" or "including" are used in this EULA, they shall be deemed to be followed by the words "without limitation." The section headings in this EULA are for convenience only and have no legal or contractual effect.

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Exhibit D

Cambium Networks

ePMP | elevate

Quick Start Guide

Introduction and Concept

Migration Steps

Warranty and Support

Capabilities and Specifications

Introduction and Concept

ePMP™ Elevate allows the network operator, by remotely or locally software upgrading each ePMP Elevate-compatible subscriber device and installing an ePMP 1000 or *e*PMP 2000 access point, to receive substantial network performance and scalability benefits without requiring new subscriber hardware or physical installations. This Quick Start Guide provides guidance through the preparation and migration process using ePMP Elevate.

Migration Step 1: Review the ePMP Elevate Prerequisite Checklist

Please reference the information in this section to ensure a smooth ePMP Elevate migration experience.

⚠️ **Caution!** *The ePMP Elevate migration process does require a brief system outage during access point transition. Please plan migration windows appropriately to minimize customer impact. Careful preparation and device pre-configuration will reduce resultant system downtime.*

3RD-PARTY SUBSCRIBER MODULE REQUIREMENTS/ACTIONS

☐ **Verify that your subscriber device is ePMP Elevate-compatible.**
Visit the ePMP Elevate website for an up-to-date listing of ePMP Elevate-compatible 802.11n devices. All subscriber devices must be capable of 3rd-party software (ePMP Elevate) installation.
*e*PMP Elevate devices may operate only as subscriber modules. ePMP Elevate does not support device operation in point-to-point, access point, or standard Wi-Fi modes.

☐ **Verify that your subscriber native software version is supported**
XM/XW software version 5.6.6 is recommended. Other software versions not officially tested.

☐ **Verify/configure your current network's Network Mode.**
If your current network is operating in **Router** mode, the network must be configured to operate in **Bridge** mode prior to ePMP Elevate transition.

☐ **Verify/configure your current network's Channel Size**.
All subscribers must be configured with a channel width of **10 MHz**, **20 MHz**, or **40 MHz** prior to ePMP Elevate transition.

☐ **Record all subscriber RSSI (Received Signal Strength Indicator) and SNR (Signal-to-Noise Ratio) metrics prior to transition.**

FREQUENCY SUPPORT AND REGULATORY CERTIFICATIONS

Upgraded ePMP Elevate subscriber modules support operation in the frequency range 5150 – 5980 MHz. Upon upgrading to ePMP Elevate subscribers will be configured to scan all available frequencies to facilitate network entry.

⚠️ **Caution!**
The user must ensure that deployed ePMP products operate in accordance to local regulatory limits. ePMP and ePMP Elevate-compatible devices may not share regulatory certifications in all regions.

Some 3rd-party radio devices were originally FCC-certified and labeled to operate in the 5.8 GHz frequency range only. An ePMP Elevate upgrade enables 3rd-party radios to operate within the U-NII-1 through U-NII-4 frequency band range 5150 – 5980 MHz. To ensure FCC regulatory compliance for ePMP Elevate-upgraded radio devices:

1. A new label must be applied to the device with the updated FCC ID clearly visible. 3rd-party radio manufacturers support FCC label requests online (labels are shipped directly).
2. FCC-allowed transmit power in the 5.8 GHz band has been reduced with the latest regulatory guidelines. ePMP Elevate adheres to these FCC power limits, and an upgrade to ePMP Elevate software may introduce a reduction of the device's operating transmit power to adhere to regulatory limits (as a result of the ePMP access point's transmit power control mechanism).

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Although the access point does dynamically control subscriber output power, the subscriber's configured transmit power parameter is not altered upon upgrade.

This potential reduction of transmit power may have an impact on your network's radio link budgets. Cambium Networks' LINKPlanner tool allows operators to model link scenarios based on transmit power, geography, distance, antenna height, and other factors.

Migration Step 2: Pre-configure the ePMP access point for deployment

To ensure a quick subscriber transition of ePMP Elevate devices to the ePMP access point, follow the procedure below to pre-configure the ePMP access point.

ACCESS POINT PRE-CONFIGURATION EQUIPMENT AND TOOLS

- ☐ ePMP 1000 or ePMP 2000 connectorized access point connected to PoE power supply port "Gigabit Data+Power" by Ethernet cable
- ☐ PC connected to PoE power supply port "Gigabit Data" by Ethernet cable
- ☐ Power Supply powered on
- ☐ Supported browser – Chrome v29, Firefox v24, Internet Explorer 10, Safari v5 or later

ACCESS POINT PRE-CONFIGURATION PROCEDURES

To ensure a quick subscriber transition of ePMP Elevate devices to the ePMP access point, follow the procedure below to pre-configure the ePMP access point.

Access Point software upgrade

To support registration from ePMP Elevate subscribers, the ePMP must be running ePMP Software Release 3.2 or later.

1 Download ePMP Software Release 3.2 (or later) from the Cambium Support website. For example, the Software Release 3.2 software package is named **ePMP-GPS_Synced-v3.2.tar.gz**.

2 Using a web browser, navigate to the access point's default IP address **192.168.0.1.**

3 Login to the access point web management interface with username: `admin` and password: `admin`.

4 Navigate to **Tools** > **Software Upgrade** and click the **Browse...** button to select the software release file downloaded in step 1.

5 Click **Upgrade**, then click the **Reboot Device** button.
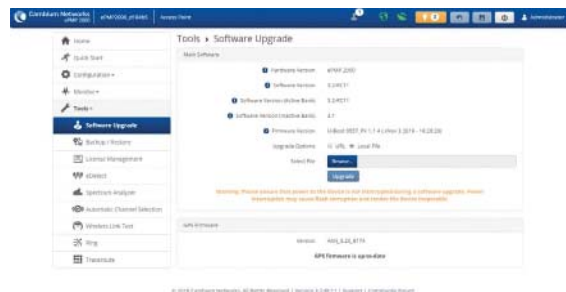
Access Point license generation and installation

To support registration from ePMP Elevate subscribers, the ePMP 1000/2000 access point must be configured with the appropriate licensing. ePMP Elevate entitlement IDs are emailed to operators by Cambium Networks distributors. The entitlement ID is used to generate a license key which is copied from the Cambium Networks License Key website and pasted to the ePMP access point to unlock ePMP Elevate functionality.

Generate license via the Cambium Networks License Keys website

1 Navigate to the Cambium Networks Entitlement Activation website.

2 Enter your entitlement IDs and click

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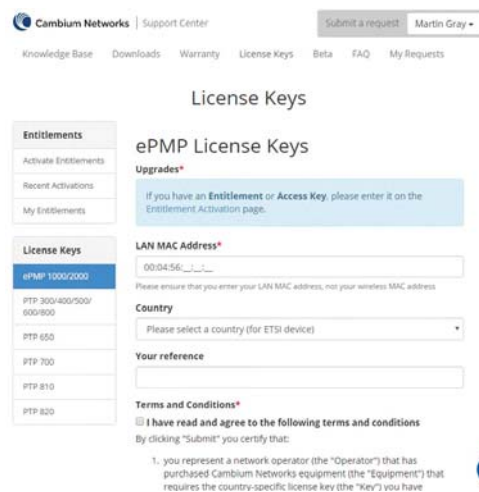
Check. Applicable entitlements are displayed below.

3   Click **Activate** to enact your entitlement.

4   Navigate to the Cambium Networks ePMP License Keys website.

5   Enter the **LAN MAC Address** of the ePMP access point.

6   Read the terms and conditions then acknowledge agreement by ticking the corresponding checkbox.

7   Click **Request Key**. An alphanumeric key is displayed below.

8   Copy the license key to the clipboard (Ctrl-C).

Enter the ePMP Elevate license key on the ePMP access point

1   Using a web browser, navigate to the access point's default IP address **192.168.0.1.**

2   Login to the access point web management interface with username: `admin` and password: `admin`.

3   In the access point web management interface, navigate to **Tools > License Management.**

4   Paste the provided license key in field **License Key.**
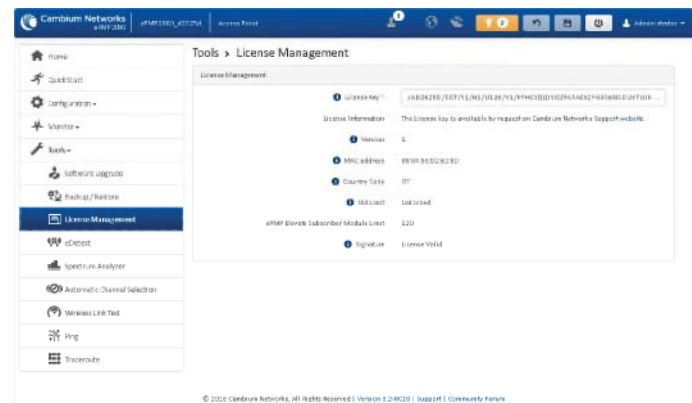
Configure additional ePMP access point parameters per your network deployment

1   Using the ePMP access point web management interface, configure all applicable radio, QoS (Quality of Service), system, networking, and security parameters.

🔷 Note

After upgrade, ePMP Elevate subscribers retain only their configured **IP Address** and **Device Name**. All other parameters, including configured access point SSIDs, frequency configuration, VLAN, etc. must be configured after upgrade to ePMP Elevate.

2   Verify access point basic security parameters:

- Wireless Security is set to **Open** or **WPA2**, and
- **WPA2 Security Key** (if applicable) is configured to the system default of `Cam39-Tai!wdmv`

After upgrade, ePMP Elevate subscribers are configured with **Wireless Security** options **RADIUS** and **WPA2** enabled, meaning that both security options will be attempted upon network entry.

After upgrade ePMP Elevate subscribers are configured with the default ePMP **WPA2 Pre-shared Key** of `Cam39-Tai!wdmv`. If the ePMP access point has been configured with a new, non-default **WPA2 Pre-shared Key**, this key

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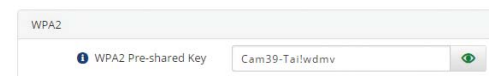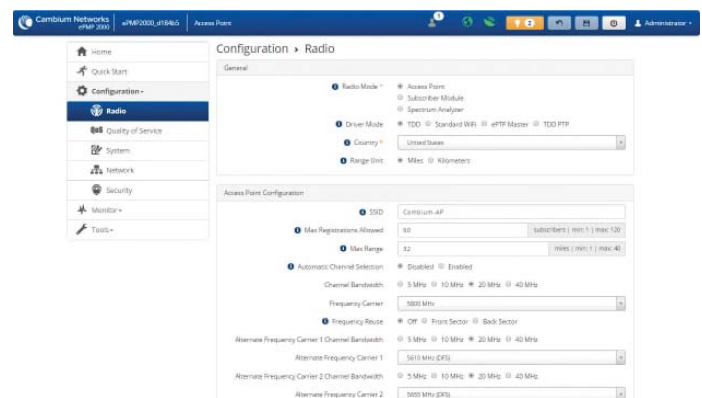
must be configured on all network subscribers to allow network entry.

3   After configuring access point parameters, click **Save** then click the **Reboot** button.

Migration Step 3: Install and power on the ePMP access point on-site

For additional ePMP access point installation requirements, see the *ePMP User Guide*, available here: Cambium Support website.

Option 1 (Preferred): When possible, install the ePMP access point onsite after pre-configuration. This technique offers the best opportunity to minimize the network outage time required upon subscriber transition to the ePMP access point.

Option 2: Alternatively, the ePMP access point may be installed as a direct replacement to the currently operating access point using the same mounting equipment (when possible). This technique will require more subscriber downtime than option 1.
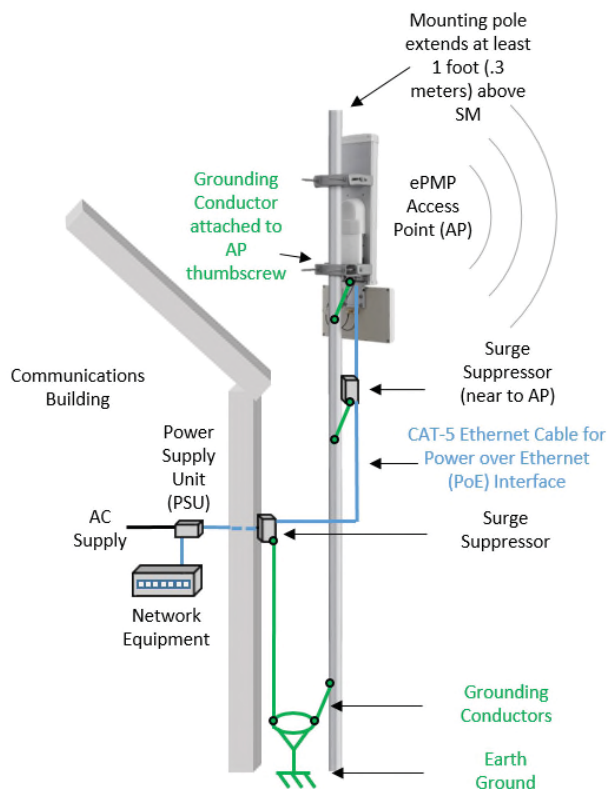
Migration Step 4: Upgrade ePMP Elevate-compatible subscribers

Installing the ePMP Elevate software on supported subscriber modules allows registration of the subscriber to the ePMP access point. This procedure may be completed remotely (over-the-air, does not require a site visit) or locally (via direct wired Ethernet connection to each subscriber module, requires a site visit).

⚠️ **Caution!** *The ePMP Elevate migration process does require a brief system outage during access point transition. Once the ePMP Elevate software has been installed on a subscriber, it will no longer register to its original access point, and network entry will only be available via the ePMP access point. Please plan migration windows appropriately to minimize customer impact. Careful preparation and device pre-configuration will reduce resultant system downtime.*

SUBSCRIBER SOFTWARE UPGRADE TO EPMP ELEVATE
1   Download ePMP Elevate software (based on device type) from the Cambium Support website.
2   Using a web browser, navigate to the subscriber module's configured management IP address.
3   Login to the subscriber module using your configured username and password.
4   Upgrade the device software using the ePMP Elevate software package from Step 1.

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5 Reboot the device.
The subscriber will now begin to scan all available frequencies and channel bandwidths for network entry via the installed ePMP access point.

🛈 Note

After upgrade, ePMP Elevate subscribers retain only their configured IP Address and Device Name. All other parameters, including configured access point SSIDs, frequency configuration, VLAN, etc. may be configured over-the-air after upgrade to ePMP Elevate.

SUBSCRIBER MODULE POST-UPGRADE NOTES

- After upgrade, the ePMP Elevate subscriber module may be accessed via its previously-configured management IP address.

- ePMP Elevate subscriber modules may be access via default username: `admin` and password `admin`.

- To reduce scan time at startup, it is recommended to configure only your primary and alternate frequencies / channel sizes. These may be configured on the ePMP Elevate subscriber's Configuration > Radio page

- After upgrade, the ePMP Elevate subscribers are configured by default to attempt network entry to the first ePMP access point scanned. To specify a specific access point SSID, configure the Preferred APs table (located on the ePMP Elevate subscriber's Configuration > Radio page) to match the SSID configuration on the deployed ePMP access point.

Migration Step 5: Power down original access point, power on ePMP access point

⚠ Caution! *This step will introduce a brief system outage as the ePMP Elevate subscribers are migrated to the ePMP access point*

ACCESS POINT TRANSITION

1 Power down the existing access point. When possible, it is recommended to physically remove original access point equipment after verifying subscriber registration and link quality (Migration Step 6).
2 Power on the ePMP access point. After this step, the ePMP Elevate-upgraded subscribers will register to the ePMP access point.

Migration Step 6: Verify subscriber registration and link quality

EPMP ELEVATE SUBSCRIBER REGISTRATION VERIFICATION

1 Log into the ePMP access point web management interface.
2 On the access point Home page, verify that the Registered Subscriber Modules statistic displays the expected subscriber count.
3 Navigate to the access point Monitor > Wireless page and validate subscriber RSSI and SNR values. Updated FCC transmit power regulations may affect link budget, see Frequency Support and Regulatory Certifications.
4 To test wireless link data capacity, navigate to the access point page Tools > Wireless Link Test.

Migration Step 7: Remove original access point equipment

Once the ePMP link has been validated, the original access point equipment may be removed.

ePMP Elevate Warranty and Support

Cambium Networks supports software maintenance of ePMP Elevate, and ePMP Elevate subscribers are operated at the user's own risk. For ePMP Elevate software support after migration, visit the Cambium Networks Support Website.

Cambium Networks does not accept any liability for reliability or interface responsiveness of ePMP Elevate-compatible hardware upgraded with ePMP Elevate.

Cambium Networks does not accept any liability for hardware damage or replacement.

ePMP Elevate Capabilities and Specifications

The following table provides detail of ePMP Elevate operation after installation/upgrade:

Registration and Licensing	**Total Registration Capacity**	120 subscribers
	ePMP Elevate Subscriber Licensing	ePMP 1000/2000 access points support a maximum number of ePMP Elevate subscriber modules based on the purchased ePMP Elevate licensing.
	ePMP Subscriber Licensing	Cambium ePMP subscriber modules are not limited by licensing, and may be deployed up to the platform limit (120 subscribers, inclusive of upgraded ePMP Elevate subscriber modules).
	Additional ePMP Elevate Licensing	Additional licenses may be purchased and installed on the ePMP 1000/2000 access point to increase the capacity of supported ePMP Elevate subscribers.
Modes of Operation	**Scheduler Modes**	TDD (Time Division Duplex) and Flexible
	ePMP Elevate Subscriber Mode Support	ePMP Elevate devices may operate only as subscriber modules. ePMP Elevate does not support device operation in point-to-point, access point, or standard Wi-Fi modes.
Radio Operation	**Frequencies Supported**	5150 – 5980 MHz Note The available spectrum for operation depends on the region. When configured with the appropriate country code, the unit will only allow operation on those channels which are permitted by the regulations.
	Channel Sizes Supported	5, 10, 20, 40 MHz
Device Management	**cnMaestro**	Inventory management, device onboarding, daily operations, and maintenance of ePMP Elevate subscriber modules and ePMP products is supported by cnMaestro cloud-based management software. ePMP Elevate subscriber modules may also be managed by other third-party Network Management/Element Management systems via the ePMP software SNMP protocol support.

<u>Exhibit E</u>
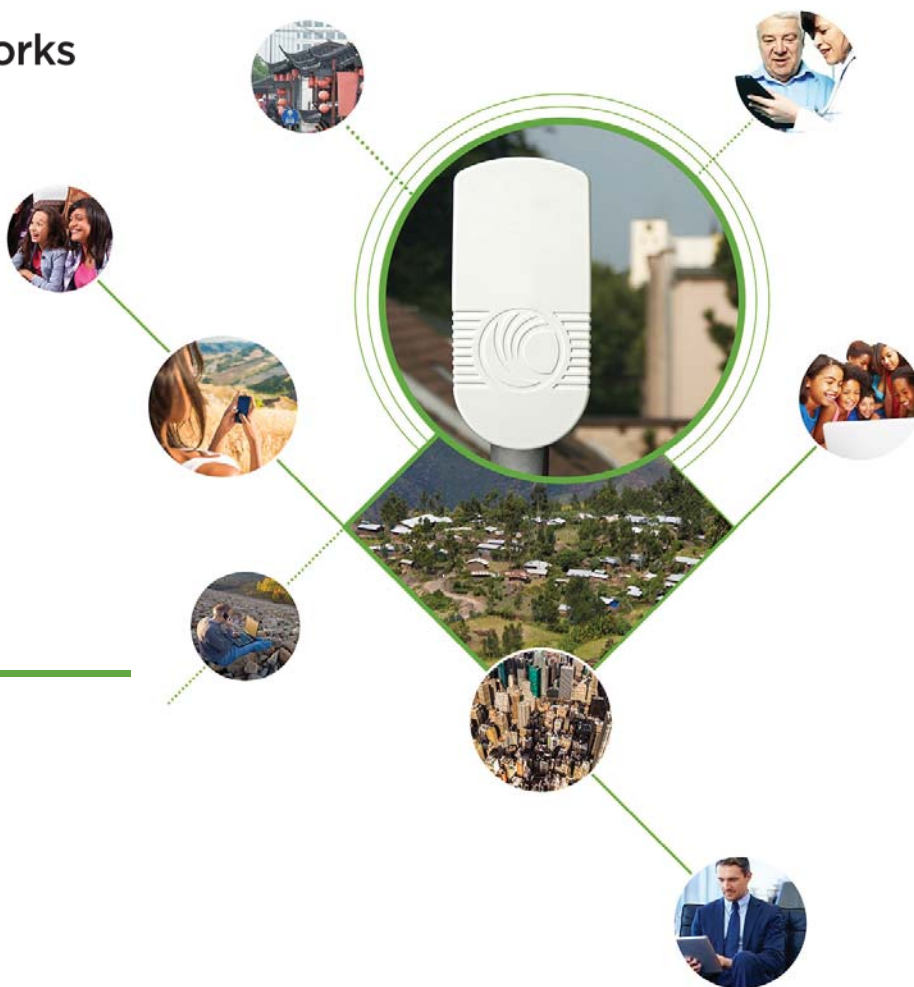
Cambium Networks

ePMP™

Release Notes

System Release 3.5.1

Sections included:

Introduction
Product Releases
Scope
Defect Fixes
Known Limitations
Technical Support
Community Forum

ePMP   CAMBIUM NETWORKS

Introduction

This document provides information for the Cambium Networks ePMP Series System Release 3.5.1.

The information in this document is subject to change without notice. The recommendations, technical data, configurations and statements in this document are believed to be reliable and accurate, but are presented without implied or express warranty. Users must take full responsibility for their applications of any product specified in this document. The information in this document is proprietary to Cambium Networks Ltd.

Product Releases

Hardware

EPMP 2000

Part Number	Description
C050900A033A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (EU)
C058900A132A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (FCC)
C050900A031A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (no cord)
C050900A231A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (EU cord)
C050900A131A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (US cord)
C050900A333A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (EU) (UK cord)
C050900A331A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (UK cord)
C050900A431A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (India cord)
C050900A531A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (China cord)
C050900A631A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW) (Brazil cord)
C050900A731A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW)(Argentina cord)
C050900A831A	ePMP 2000: 5 GHz AP with Intelligent Filtering and Sync (ROW)(ANZ cord)
C050900L033A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (EU)
C058900L132A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (FCC)
C050900L031A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (no cord)
C050900L231A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (EU cord)
C050900L131A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (US cord)
C050900L333A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (EU) (UK cord)

ePMP

CAMBIUM NETWORKS

C050900L331A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (UK cord)
C050900L431A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (India cord)
C050900L531A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (China cord)
C050900L631A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (Brazil cord)
C050900L731A	ePMP 2000: 5 GHz AP Lite with Intelligent Filtering and Sync (ROW) (Argentina cord)

EPMP 1000

The following tables provides the key components available for purchase:

Part Number	Description
C050900A011A	ePMP 1000: 5 GHz Connectorized Radio with Sync (ROW)
C050900A013A	ePMP 1000: 5 GHz Connectorized Radio with Sync (EU)
C058900A112A	ePMP 1000: 5 GHz Connectorized Radio with Sync (FCC)
C050900A021A	ePMP 1000: 5 GHz Connectorized Radio (ROW)
C050900A023A	ePMP 1000: 5 GHz Connectorized Radio (EU)
C058900A122A	ePMP 1000: 5 GHz Connectorized Radio (FCC)
C050900C031A	ePMP 1000: 5 GHz Integrated Radio (ROW)
C050900C033A	ePMP 1000: 5 GHz Integrated Radio (EU)
C058900C132A	ePMP 1000: 5 GHz Integrated Radio (FCC)
C024900A011A	ePMP 1000: 2.4 GHz Connectorized Radio with Sync
C024900A021A	ePMP 1000: 2.4 GHz Connectorized Radio
C024900C031A	ePMP 1000: 2.4 GHz Integrated Radio

FORCE 110

Part Number	Description
C058900C042B	ePMP Force 110AR5-25 High Gain (25 dBi) SM/PTP Radio (FCC)
C050900C043B	ePMP Force 110AR5-25 High Gain (25 dBi) SM/PTP Radio (EU)
C050900C041B	ePMP Force 110AR5-25 High Gain (25 dBi) SM/PTP Radio (ROW)
C058900B052A	ePMP Force 110 PTP - High Performance PTP Radio (FCC)
C050900B053A	ePMP Force 110 PTP - High Performance PTP Radio (EU)
C050900B051A	ePMP Force 110 PTP - High Performance PTP Radio (ROW)

CAMBIUM NETWORKS

FORCE 180

Part Number	Description
C058900C072A	ePMP 5 GHz Force 180 Integrated Radio (FCC) (US cord)
C050900C071A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (no cord)
C050900C073A	ePMP 5 GHz Force 180 Integrated Radio (EU) (EU cord)
C050900C171A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (US cord)
C050900C271A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (EU cord)
C050900C371A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (UK cord)
C050900C373A	ePMP 5 GHz Force 180 Integrated Radio (EU) (UK cord)
C050900C471A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (India cord)
C050900C571A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (China cord)
C050900C671A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (Brazil cord)
C050900C771A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (Argentina cord)
C050900C871A	ePMP 5 GHz Force 180 Integrated Radio (ROW) (ANZ cord)

FORCE 190

Part Number	Description
C058900C082A	ePMP Force 190 5 GHz Subscriber Module (FCC) (US Cord)
C050900C083A	ePMP Force 190 5 GHz Subscriber Module (EU) (EU Cord)
C050900C873A	ePMP Force 190 5 GHz Subscriber Module (EU) (UK Cord)
C050900C081A	ePMP Force 190 5 GHz Subscriber Module (RoW) (No Cord)
C050900C181A	ePMP Force 190 5 GHz Subscriber Module (RoW) (US Cord)
C050900C281A	ePMP Force 190 5 GHz Subscriber Module (RoW) (EU Cord)
C050900C481A	ePMP Force 190 5 GHz Subscriber Module (RoW) (India Cord)
C050900C581A	ePMP Force 190 5 GHz Subscriber Module (RoW) (China Cord)
C050900C681A	ePMP Force 190 5 GHz Subscriber Module (RoW) (Brazil Cord)
C050900C781A	ePMP Force 190 5 GHz Subscriber Module (RoW) (Type-N Plug Cord)
C050900C881A	ePMP Force 190 5 GHz Subscriber Module (RoW) (ANZ Cord)
C050900C981A	ePMP Force 190 5 GHz Subscriber Module (RoW) (No PSU)

CAMBIUM NETWORKS

FORCE 200

Part Number	Description
C058900C062A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (FCC) (US cord)
C050900C061A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (no cord)
C050900C063A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (EU) (EU cord)
C050900C161A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (US cord)
C050900C261A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (EU cord)
C050900C361A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (UK cord)
C050900C363A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (EU) (UK cord)
C050900C461A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (India cord)
C050900C561A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (China/ANZ cord)
C050900C661A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (Brazil cord)
C050900C761A	ePMP 5 GHz Force 200AR5-25 High Gain Radio (ROW) (Argentina cord)
C024900C161A	ePMP 2.4 GHz Force 200AR2-25 High Gain Radio (US cord)
C024900C261A	ePMP 2.4 GHz Force 200AR2-25 High Gain Radio (EU cord)
N000900L021A	ePMP Force 200 Radome

ACCESSORIES

Part Number	Description
C050900D021A	ePMP 2000/1000: 5 GHz Sector Antenna - 90° / 120°
C050900D020A	ePMP 2000: 5 GHz Smart Antenna
C050900D002A	ePMP 1000: 5 GHz Sector Antenna - 120°
C050900D003A	ePMP 1000: 5 GHz Sector Antenna - 90°
C024900D004A	ePMP 1000: 2.4 GHz Sector Antenna - 90° / 120°
N000900L001B	ePMP 1000: Spare Power Supply for Radio with Gigabit Ethernet (no cord)
N000900L002A	ePMP 1000: Spare Power Supply for Radio with 100Mbit Ethernet (no cord)
N000900L005A	ePMP 1000: Spare GPS Antenna
C050900H007B	4 pack of C050900D007B: ePMP 110A5-25 Dish Antenna (25 dBi) for ePMP Connectorized Radio

Embedded Software

RELEASE SOFTWARE

New ePMP software releases may be downloaded from the ePMP Downloads website.

The following software update is provided with ePMP System Release 3.5.1:

Device Description	Applicable Software Package
Connectorized Radio with Sync	ePMP-GPS_Synced-v3.5.1.tar.gz
Integrated Radio / Connectorized Radio	ePMP-NonGPS_Synced-v3.5.1.tar.gz
CNUT package (for all radios)	ePMP-3.5.1.pkg3

EPMP ELEVATE SOFTWARE

The following software is provided with ePMP Elevate in ePMP System Release 3.5.1:

Application Description	Applicable Software Package
ePMP Elevate (XM firmware devices) *Use this file if upgrading an XM device to ePMP Elevate for the first time*	UBNTXM-ubntxm-squashfs-factory.bin
ePMP Elevate (XW firmware devices) *Use this file if upgrading an XM device to ePMP Elevate for the first time*	UBNTXW-ubntxw-squashfs-factory.bin
ePMP Elevate (XM firmware devices)	UBNTXM-v3.5.1.tar.gz
ePMP Elevate (XW firmware devices)	UBNTXW-v3.5.1.tar.gz

SPECIAL SOFTWARE UPGRADE NOTICE

All users of ePMP product are encouraged to upgrade the Connectorized Radio with Sync, Integrated Radio, Connectorized Radio, Force 180, Force 190 and Force 200 units to the latest System Release 3.5.1. ePMP software updates can be downloaded from the ePMP Downloads website. For instructions on upgrading an ePMP device, see the *ePMP User Guide*.

Note
While upgrading a **Connectorized Radio with Sync** from the factory, ensure both the device software banks are updated. Upgrade to the latest software **TWICE** so that both Active & Backup are updated. This is NOT required for Integrated or Connectorized Radios since these radios do not have two software banks.

While upgrading devices with System Release 1.0.3 or earlier, ensure that the browser cache is cleared prior to the upgrade.

Caution
ePMP radios running System Release 2.1 or earlier cannot be directly upgraded to System Release 3.5.1. Please upgrade to System Release 2.6 first, then upgrade to System Release 3.5.1. Stepping through System Release 2.6 is not required if the ePMP radio is running System Release 2.2 or later.

UPGRADING THE ON-BOARD GPS CHIP FIRMWARE

Beginning with System Release 2.0, users can upgrade the firmware of the on-board GPS chip present on the **Connectorized Radio with Sync**. All users are strongly encouraged to upgrade the on-board GPS chip firmware in order to avoid sporadic lock up of the chip during normal operation. ePMP software updates can be downloaded from the ePMP Downloads website.

GPS Chip and Software Reference

	ePMP 1000 (1st Generation)	ePMP 1000 (2nd Generation)	ePMP 2000
GPS Chip Type	GPS only	GPS + GLONASS	GPS + GLONASS
Default GPS Firmware	AXN_1.51_2801	AXN_3.20_8174	AXN_3.20_8174
Potential Issues (With Default Firmware Installed)	GPS chip locked, resulting in loss of sync and no display of firmware version or visible/tracked satellites	Occasional sync loss following low number of tracked satellites for customers in APAC and Russia regions	Occasional sync loss following low number of tracked satellites for customers in APAC and Russia regions
Current GPS Firmware	AXN_1.51_2838	AXN_5.1._8174	AXN_5.1._8174
Corresponding ePMP Software Release	2.1	3.5.1	3.5.1
Known issues (With Current GPS Firmware)	None	None	None

For instructions on upgrading the GPS chip firmware, see below or refer the *ePMP User Guide*.

To upgrade the on-board GPS chip on a Connectorized Radio with Sync (1st Generation - purchased 2015 and prior):

1. Navigate to **Monitor > GPS** to check the **GPS Firmware Version** that is currently present on the radio.
2. If the GPS Firmware Version displays **AXN_1.51_2838** and/or "**GPS Firmware is up-to-date**", do nothing. The on-board GPS chip already has the latest firmware.
3. If the GPS Firmware Version displays **AXN_1.51_2801**, navigate to **Tools > Software** Upgrade page.
4. Under the **GPS Firmware** upgrade section, select the same package used to upgrade the device's firmware ex: **ePMP-GPS_Synced-v3.5.1.tar.gz.**
5. Click the **Upgrade** button.
6. The upgrade can take up to 3 minutes. Once the upgrade is done, the radio's UI prompts for a reboot and the reboot button will be highlighted.
7. Click the Reboot button on the top right corner of the UI.
8. Once the radio has completed its reboot process, check under the **Monitor > GPS** page to ensure that the **GPS Firmware Version** displays **AXN_1.51_2838.**

To upgrade the on-board GPS chip on a Connectorized Radio with Sync (2nd Generation - purchased 2016 and after):

1. Navigate to **Monitor > GPS** to check the **GPS Firmware Version** that is currently present on the radio.
2. If the GPS Firmware Version displays **AXN_5.1_8174** and/or "**GPS Firmware is up-to-date**", do nothing. The on-board GPS chip already has the latest firmware.
3. If the GPS Firmware Version displays **AXN_3.20_8174**, navigate to **Tools > Software** Upgrade page.
4. Under the **GPS Firmware** upgrade section, select the same package used to upgrade the device's firmware ex: **ePMP-GPS_Synced-v3.5.1.tar.gz.**
5. Click the **Upgrade** button.
6. The upgrade can take up to 3 minutes. Once the upgrade is done, the radio's UI prompts for a reboot and the reboot button will be highlighted.
7. Click the Reboot button on the top right corner of the UI.
8. Once the radio has completed its reboot process, check under the **Monitor > GPS** page to ensure that the **GPS Firmware Version** displays **AXN_5.1_8174.**

Note

On occasion the **GPS Firmware Version** under **Monitor > Tools** may display **NA**. This means that the GPS chip has already locked up and is no longer communicating with the main processor. Perform a hard reboot (power cycle the entire unit) to restore communication. Then perform steps 3 through 8 above.

This is NOT required for Integrated or Connectorized Radios since these radios do not have an on-board GPS chip.

NEW LOCAL IP

Prior to System Release 2.1, in both Bridge and NAT mode, the ePMP Device was previously accessible through a local IP of 10.1.1.254 through the LAN port. Beginning with System Release 2.1, the local IP has been updated to **169.254.1.1(/16).**

EPMP POST-UPGRADE IP ADDRESSING

If **Device IP address Mode** is set to **DHCP** and the device is unable to retrieve IP address information via DHCP, the device management IP is set to fallback IP of *192.168.0.1* (AP mode), *192.168.0.2* (SM mode), *192.168.0.3* (Spectrum Analyzer mode) or a previously configured static Device IP Address. Units can always be accessed via the Ethernet port with a local IP of *169.254.1.1*.

SPECTRUM ANALYZER ON SM WHEN USING PORT FORWARDING OR DMZ

If port forwarding or DMZ is enabled on the SM, it is necessary to add a port forwarding entry for the Spectrum Analyzer to work. The Spectrum Analyzer uses port 8001 and this must be explicitly added in the port forwarding table under **Configure>Network>NAT>Advanced**, on the radio's GUI. In addition, once the Spectrum Analyzer is launched on the client PC, select the Port Forwarding IP as the device IP address under **Tools>Preferences**, on the Spectrum Analyzer Java tool. Depending on the network configuration, the generation configuration scheme must be **Client PC > Port_Forwarding_IP:8001 > Device_IP:8001.**

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SPECTRUM ANALYZER WHEN MANAGEMENT VLAN IS ENABLED

When Management VLAN is enabled on the ePMP radio, the Spectrum Analyzer client must be launched from the same network as the Management VLAN.

CHROME / FIREFOX WEB MANAGEMENT INTERFACE ACCESS – SPECIAL NOTICE FOR SOFTWARE RELEASE 3.4 / 3.4.1

If access to the web management interface is lost after upgrading to Software Release 3.4 or 3.4.1, it is recommended to clear the browser cookies and cache to regain access. This workaround is only applicable to devices which have been loaded with Software Release 3.4 or 3.4.1.

Instructions for clearing cookies / cache in Google Chrome:
https://support.google.com/accounts/answer/32050?co=GENIE.Platform%3DDesktop&hl=en

Instructions for clearing cookies / cache in Mozilla Firefox:
https://support.mozilla.org/en-US/kb/delete-cookies-remove-info-websites-stored

cnMaestro™

*cn*Maestro is a cloud-based or on-site platform designed to monitor, configure, operate, upgrade, manage and monitor ePMP systems. For more information, see the cnMaestro website.

![ePMP logo]

New Features

ePMP Elevate Floating License Server Official Release

Software Release 3.5.1 introduces official support for the ePMP Elevate Floating License Server functionality. There are two types of ePMP Elevate license management mechanisms available on the ePMP device – Flexible and Fixed, as described below:
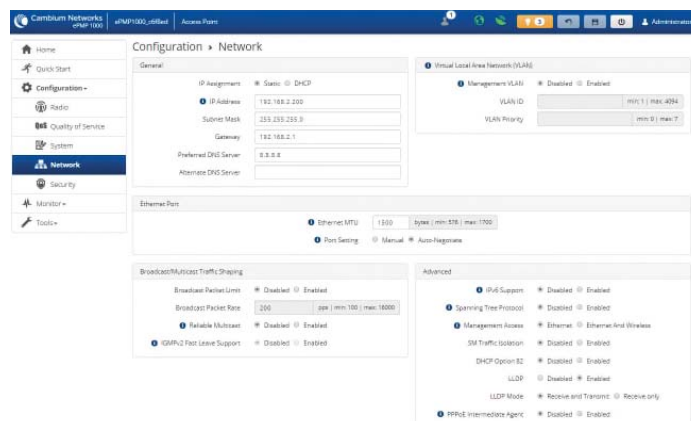
Flexible Licensing ☁

With Flexible Licensing, your licenses are stored in a license server and can be shared among all your Access Points. Each Access Point will only use as many licenses as it has connected subscribers. When a subscriber disconnects, a license is returned to the pool and can be used by any other Access Point.

In order to use Flexible Licensing, your Access Points must:

- be able to make HTTPS requests out to the Internet,
- be running firmware version 3.5 or greater,
- have an accurate NTP time source.

Use Flexible Licensing ➜

Fixed Licensing 🖴

With Fixed Licensing, you will generate a license key for a specific MAC address, and load that license key into the Access Point. The license key represents the number of Elevate Subscribers that can be supported by that Access Point. The license key may not be transferred to any other Access Point.

You should use Fixed Licensing if your Access Points:

- are unable to make HTTPS requests to the Internet, or
- are running firmware version 3.4.1 or earlier, or
- don't have an accurate NTP time source.

Use Fixed Licensing ➜

The AP's **License Management** page is used to:

- Install licensing for ePMP Elevate subscriber access allotments
- Convert the AP from Lite (10 subscriber) to Full (120 subscriber)
- Configure the Country Code ETSI-locked devices

![Note icon] Note

ePMP 3.4.1 and earlier Releases support only Fixed Licensing.

Elevate Flexible Licensing is available only for ePMP AP devices with GPS sync.


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Country Code configuration for ETSI locked device and Full Capacity Keys for AP Lite devices are available only via Fixed License Management. Elevate is available via Fixed or Flexible License Management.

Note

To use flexible licensing, the AP must:

1. be able to make HTTPS requests out to the Internet

2. be running firmware version 3.5.1 or greater

3. have an accurate NTP time source
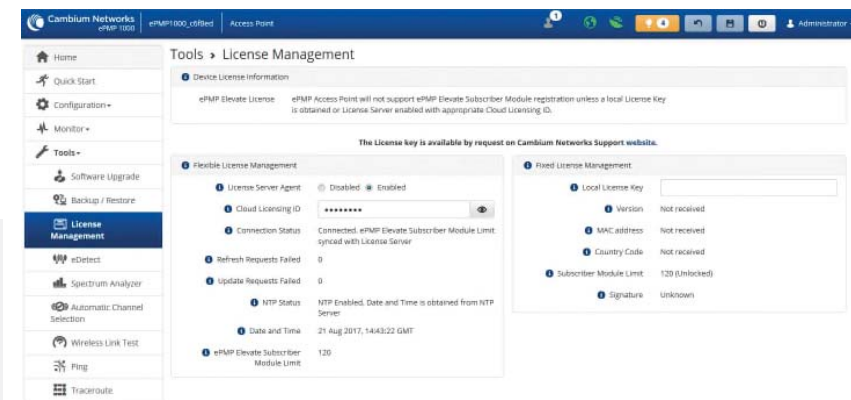
AP web management interface flexible licensing parameters:

Attribute	Meaning
Flexible License Management	
License Server Agent	Disabled: No communication with the License Server is established
	Enabled: Enables License Server functionality to obtain the number of allowed ePMP Elevate SMs to be connected to the AP
Cloud Licensing ID	This field represents a Cambium Networks customer identification used for AP identification on the License Server. This identifier is generated upon License Entitlement activation at the Cambium Networks web-based Support Center.
Connection Status	The **Connection Status** displays the License Server process state when **License Server Agent** is **Enabled**. This status may also be referenced on the device **Home** page.
Refresh Requests Failed	The number of failed refresh (polling) requests to the License Server. The **ePMP Elevate Subscriber Module Limit** resets to 1 after the 3rd failed refresh request.
Update Requests Failed	The number of failed update (licensing information transfer) requests to the License Server. The **ePMP Elevate Subscriber Module Limit** resets to 1 after the 5th failed updated request.
NTP Status	Represents whether or not the current time and date have been retrieved from the configured NTP server
ePMP Elevate Subscriber Module Limit	The number of ePMP Elevate devices allowed to register to the AP

ePMP   CAMBIUM NETWORKS

FLEXIBLE LICENSE GENERATION PROCEDURE

Procedure:

Follow this procedure to set up the Cambium Networks licensing portal to host ePMP Elevate licenses:

1   Purchase the desired license product Entitlements from your Cambium Networks distributor (C050900S510A – 10 ePMP Elevate licenses)

2   Cambium Networks will email your Entitlements to the provided email address. An example of the email is displayed below:

Cambium Networks is pleased to deliver an Entitlement Certificate that you may use to redeem your recent purchase of software license key(s). To redeem this entitlement, please go to the Cambium Support Center and follow the instructions. If you need any assistance with this process, please contact Cambium Networks Support by phone or support@cambiumnetworks.com.

Entitlement Details

Entitlement ID:		Start Date:	08/04/2017
Company:		End Date:	Never expires
Contact:			
Cambium Order Reference:			
Your Order Reference:			

Associated Products

Product Number	Description	Quantity Ordered	Remaining Quantity
C050900S501A 1	ePMP Elevate: 1 Subscriber License	200	200
C050900S510A 1	ePMP Elevate: 10 Subscriber License	5	5

Cambium Networks Support

3   Log into support.cambiumnetworks.com/licensekeys and navigate to **Activate Entitlements**. Enter your provided **Entitlement ID** in the **Check Entitlements** section and click the **Check** button. Entitlement details are listed in the dialogue below. Click **Activate** to activate the Entitlement's corresponding licenses.

License Keys

Entitlements	Check Entitlements
Activate Entitlements	
Recent Activations	
My Entitlements	

Enter as many entitlement IDs as you like, one per line, then press **Check**.

Check

License Keys

| ePMP 1000/2000 |
| PMP / PTP 450 |
| PTP 300/400/500/600/800 |
| PTP 650 |
| PTP 670 |
| PTP 700 |
| PTP 810 |
| PTP 820 |

Entitlement: _____ Save

Part Number	Description	Available Quantity	
C050900S501A	ePMP Elevate: 1 Subscriber License	10 of 10	Activate

Terms and Conditions | Privacy Policy

💬 Chat

4   Select **Use Flexible Licensing**.

5   Click Activate on the resulting page to activate your company account.

6   On the resulting dialogue, enter the number of licenses to activate then click Activate.

ePMP   CAMBIUM NETWORKS

7   The recently-activated license keys are displayed, click **Details** to display the
     corresponding license key information.

8   To use licenses from the pool, enter the corresponding **Cloud Licensing ID** on the AP's
     License Managmenet page.

⚠ Caution

Keep your **Cloud Licensing ID** secret to avoid unintended license pool usage!

CAMBIUM NETWORKS

ENABLING AP FLEXIBLE LICENSE MANAGEMENT

Procedure:

Follow this procedure to configure the ePMP Access Point to retrieve Elevate licensing information from the Flexible license server.

 Note

To use flexible licensing, the AP must:

1. be able to make HTTPS requests out to the Internet
2. be running firmware version 3.5.1 or greater
3. have an accurate NTP time source

1 Follow the steps in section Flexible License Generation Procedure on page 12 to activate the applicable licenses on the Cambium Networks Support Center

2 Copy the Cloud Licensing ID generated on the Support Center website

ePMP   CAMBIUM NETWORKS

License Request: ePMP Elevate: 1 Subscriber License

State:	Complete
Date:	2017-08-21
Entitlement ID:	
Quantity:	1
Cloud Licensing ID:	
Company Account:	

These licenses have been loaded into the Cambium Cloud Licensing system. To access them, enter the Cloud Licensing ID above into your device.

---

3   Log into the ePMP AP and navigate to **Tools > License Management**

4   Set **License Server Agent** to **Enabled**

5   Paste the **Cloud Licensing ID** from Step 2 into the **Cloud Licensing ID** field

6   Verify the license server connection in with field **Connection Status**

7   Verify the enacted licensing in field **ePMP Elevate Subscriber Module Limit**

🛈 Flexible License Management

🛈 License Server Agent	○ Disabled ● Enabled
🛈 Cloud Licensing ID	•••••••• 👁
🛈 Connection Status	Connected. ePMP Elevate Subscriber Module Limit synced with License Server
🛈 Refresh Requests Failed	0
🛈 Update Requests Failed	0
🛈 NTP Status	NTP Enabled, Date and Time is obtained from NTP Server
🛈 Date and Time	29 Aug 2017, 00:39:46 GMT
🛈 ePMP Elevate Subscriber Module Limit	120

Additional Elevate Subscriber Support

For operators of 2.4 GHz networks with ePMP Elevate subscribers, Software Release 3.5.1 introduces support for the following additional hardware types:

- NanoStation Loco M2 (board.sysid = 0xe866)
- NanoStation Loco M2 (board.sysid = 0xe867)

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WPA2 Security Vulnerability Fix (KRACK)

Software Release 3.5.1 includes security improvements to prevent Key Reinstallation attacks targeted at ePMP radio networks.

This security improvement includes:

- Prevention of reinstallation of temporal keys (IGTK, GTK) during WPA key handshake

Support for Myanmar Country Code

The Myanmar Country Code is now supported for ePMP with the following operation:

Band	Frequency Range	Valid Center Frequencies 5/10 MHz Channel Size	Valid Center Frequencies 20 MHz Channel Size	Valid Center Frequencies 40 MHz Channel Size	EIRP Limit
2.4 GHz	2400 – 2500 MHz	2407 – 2492 MHz (every 5 MHz)	2412 – 2487 MHz (every 5 MHz)	2422 – 2477 MHz (every 5 MHz)	36 dBm
5.8 GHz	5725 – 5875 MHz	5730 – 5870 MHz (every 5 MHz)	5735 – 5865 MHz (every 5 MHz)	5745 – 5855 MHz (every 5 MHz)	30 dBm

Force 190 ETSI Region DFS Support

Beginning with Software Release 3.5.1, Force 190 devices are supported in ETSI regulatory environments. The Force 190 units use region-specific Dynamic Frequency Selection (DFS) mechanisms based on the device **Country** parameter setting.

Note

When operating in a region which requires DFS, ensure that the AP (BHM) is configured with alternate frequencies and that the SM (BHS) is configured to scan for these frequencies to avoid long outages.

ePMP

Defect Fixes (System Release 3.5.1)

Defects in green are resolved
Defects in black are open

Tracking	Description / Workaround
15033	All Elevate SMs except 1 are dropped after upgrade request when Licensed capacity is exceeded
14989 14994	GPS chip information is not displayed with tddstats CLI command
15012	Not possible to upgrade GPS firmware on 2.5 GHz and 6 GHz radios
14970	Unexpected reboot of Force 180 / Force 200 in cold conditions
14928	Spectrum Analyzer terminates after two minutes of operation
14912	[Elevate] NanoStation Loco M2 (board.sysid=0xe867) not supported
14963	[Elevate] NanoStation Loco M2 (board.sysid=0xe866) not supported
14599	IPv6 Gateway not functioning
14921	Latitude and Longitude fields do not accept non-integer values
14558 14935	GUI error when saving RADIUS User Certificate
14894 14770	GUI error when changing device IP Address
14888	[ePMP 2000] LLDP neighbors not detected by ePMP 2000 AP
13790	DHCP Reply from SM may be dropped by AP
12753	DFS Support for Force 190
14945	[Elevate] XM devices in network may have the same Separate Wireless Management Interface MAC address assignments
14910	Radio becomes inaccessible when switching from Bridge to NAT mode with Separate Management IP and Management VLAN enabled
14493	Unable to log into device for 2 minutes after factory default procedure
14922	Myanmar country code support
14839	SNMP MIB parameter sysLocation is not supported
14872	[Elevate] Nanobridge M5 XM always displays Ethernet Port Status as "Down"
14904	IP address of Wireless Gateway obtained from PPPoE server is not displayed on GUI (when Separate Management IP enabled and VLAN retrieved via RADIUS VSA
14918	SNMP sysObjectID does not return Hardware SKU
14887	[Elevate] Software upgrade/downgrade not functional for Elevate XM radios
14968	ePMP key reinstallation attack security improvements

Known Problems or Limitations (System Release 3.5.1)

Tracking	Description / Workaround
15004	[Elevate] AP drops Elevate radio connections when switching from Fixed to Flexible licensing

ePMP   CAMBIUM NETWORKS

Tracking	Description / Workaround
14997	Wrong DFS status displayed on ePMP SM Home page when device operates on ETSI non-DFS channel
14962	General error displayed on login page after redirecting to re-configured device IP address Workaround: Reload web page
15016	AP/SM does not obtain IP address via DHCPv6 server
15017	Separate Management IP retrieved from DHCP server after configuring IP Assignment to Static
15007	[Elevate] DNS and Gateway settings may not be carried over when upgrading to ePMP Elevate
15009	SM in NAT mode (Separate Management IP and PPPoE enabled, RADIUS authentication with VLAN VSA retrieval) cannot be upgraded/downgraded, radio connection drops every 10 minutes Workaround: Disable RADIUS authentication
14996	"Applying" is displayed on GUI for an extended period when saving changes on the Security page
15010	[Elevate] Spectrum Analyzer may disconnect after 20 seconds if Static IP Assignment has been modified from original setting Workaround: Click Connect and restart spectrum scan
15006	Satellites table is empty on GPS Gync AP configured in SM mode

Defect Fixes (System Release 3.5)

Tracking	Description / Workaround
14490	[ePMP 2000] Clock calibration between ePMP and ePMP Elevate devices
14455	2nd Management interface obtains Fallback IP with VLAN enabled
14771	Reliable Multicast parameters removed from ePTP mode
14567	[Elevate] Automatic workaround to reset device when Elevate XW Nanostation Loco M5 subscriber Ethernet LAN port goes down
10124	Ethernet watchdog error on SM
14889	"\" symbol for DeviceName crashes web management interface
14721	[Elevate] Unsupported Elevate models removed from MIB file
13308	[Elevate 2.4] RADIUS GUI Authentication not functional
14497	Erroneous validation failure between Lan IP address and Lan Gateway IP addresses
14734	Fixed tcpdump vulnerability to gain root CLI access

Known Problems or Limitations (System Release 3.5)

Tracking	Description / Workaround
14862	Link test error message when run with more than 28 SMs connected to ePMP2000 AP. Workaround: Restart the link test

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Tracking	Description / Workaround
14868	Primary Frequency Carrier is not saved to .config file if ACS is started after selecting Country. Workaround: Device reboot or re-run ACS
14866	Save and Undo buttons are highlighted after importing JSON/BINARY configuration with ACS Enabled. Workaround: Web management interface refresh
14872	[Elevate 2.4] ePMP Elevate NanoBridge M2 XM always displays Ethernet Status Down. Display-only issue, Ethernet port is functional. (fixed in 3.5.1)
14846	[Elevate 2.4] Error message 'Please perform device reboot before Upgrading software.' is shown on GUI during SW upgrade. Workaround: Web management interface refresh
14888	LLDP neighbors are not seen by ePMP 2000 AP (fixed in 3.5.1)
14772	"Applying" button is present for a long time in NAT mode if the Community String has changed before. Workaround: Web management interface refresh
14891	"Applying" button is present for a long time if IP address received from DHCP via VLAN interface with enabled LLDP. Workaround: Disable LLDP functionality
14816	Switching IP assignment to Dynamic creates second user GUI session. Workaround: Device reboot
14776	After reset to factory defaults SM in Standard WiFi mode cannot connect to AP configured in Standard WiFi mode on 20 MHz channel bandwidth.
14894	Web management interface shows error message when trying to change IP address. Workaround: Device reboot (fixed in 3.5.1)
14873	Cannot import binary configuration with non-valid License Key.
14904	Wireless Gateway is shown as empty on ePMP SM web management interface if obtained from PPPoE server with Separate Management IP and VSA configured. (fixed in 3.5.1)
14770	New IP Address cannot be assigned if the Community String has been previously changed. Workaround: Device reboot (fixed in 3.5.1)
14906	Unable to force Sector Antenna on ePMP2000 AP via SNMP. Workaround: Use web management interface to force Sector Antenna
14783	Admin password erroneously applied to Full AP radio after exporting configuration from Lite AP radio
14873	Web management interface will not show error after importing binary configuration with non-value license key

Known problems or limitations (System Release 3.4.1)

Tracking	Description / Workaround
14910	Device becomes available after switching from Bridge to NAT mode then enabling Separate Management IP and VLAN. Workaround: Power reset the device (fixed in 3.5.1)
14611	[Elevate 2.4] "SM disassociated from AP. Reason 32/33/48" during Stability test {XW}
14613	Incorrect processing status on GUI when Link Test is failed
14609	Home User erroneously able to configure network configuration (fixed in 3.5)
14614	The Ping utility does not show latency if use less than 8 of 'Buffer Size'

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Tracking	Description / Workaround
14612	[Elevate 2.4] Link Test is not completed properly (fixed in 3.5)

Known problems or limitations (System Release 3.4)

Tracking	Description / Workaround
14591	Not able to login to the GUI after changing the IP. Works with Chrome but not with Firefox. However, once you clear the cache and cookies, it works with Firefox. (fixed in 3.4.1) See section **Chrome / Firefox Web Management Interface Access – Special Notice for Software Release 3.4** for additional information.
14589	Upgrade of 2.4 and 5 GHz ePMP Elevate devices to 3.4 will shows as failed when upgraded via cnMaestro. However, the devices do upgrade and a refresh on the cnMaestro screen will show that the devices are running 3.4 after a successful upgrade. (fixed in 3.4.1)
14470	[ePMP Elevate 2.4] Unexpected behaviour of Port Speed Settings
13308	[ePMP Elevate 2.4] RADIUS GUI Authentication: Authentication not functional if used RADIUS authentication method (fixed in 3.5)
14477	DHCP Server on SM sends host name as lease time if only digits are used for DHCP client name
14510	Unable to Export eDetect scan results in Chromium browser with AdBlock extension
14558	GUI shows error message after saving User Certificate for RADIUS Server (fixed in 3.5.1)
14458	[ePMP Elevate 2.4, XM] Cambium Elevate operating Tx Power exceeds original non-Cambium software-configured Tx Power by 1.5 – 3 dBm

Known problems or limitations (System Release 3.3)

Tracking	Description / Workaround
13238	[ePMP Elevate] ePMP Elevate devices are not supported by CNUT
13346	[ePMP Elevate] Device name and network settings are not copied from original device configuration (resolved by ePMP Elevator tool)
13299	[ePMP Elevate] Not possible to configure Uplink Max Rate to any MCS except 7th on single stream devices
14016	After configuring the SM device into NAT mode and reconfiguring the WAN IP address, the Spectrum Analyzer tool is only available via previously-configured Bridge mode IP address
14030	Unable to add new AP to Preferred APs table when in "Show Details" view. As a workaround, add new APs to the table when in "Show List" view. (fixed in 3.4)
14131	[IPv6] AP and SM Separate Management Interface don't display obtained DHCP address on without manual refresh (fixed in 3.4)

Known problems or limitations (System Release 3.2.2)

Tracking	Description / Workaround
13846	It is not possible to change the SM's Network configuration from Bridge to Router mode via SNMP. (fixed in 3.3)
13825	GUI indicates In-Service-Monitoring DFS status for 5-10 seconds after switching to non-DFS channel.

ePMP

Known problems or limitations (System Release 3.2.1)

Tracking	Description / Workaround
13783	User cannot login to GUI by DNS address if URL contains dash (-). (fixed in 3.3)
13516	[ePMP Elevate] XM hardware – Spectrum Analyzer not supported (fixed in 3.3)
13343	[ePMP Elevate] XW hardware – If an ePMP Elevate module is interrupted during an ePMP software upgrade, TFTP flash recovery of ePMP Elevate software may fail. As a workaround, load the native device software, then upgrade again to ePMP Elevate
13552	[ePMP Elevate] After changing the device management IP address, the browser may not automatically redirect to the new IP address. Workaround: Enter the new management IP address in the browser address bar. (fixed in 3.3)
13630	[ePMP Elevate] Upon downgrading from Release 3.2.1 to Release 3.2, the Remote Management parameter may be set to Disabled. Workaround: Re-enable the Remote Management parameter after downgrading from Release 3.2.1 to Release 3.2.

Known problems or limitations (System Release 3.2)

Tracking	Description / Workaround
13472	[ePMP Elevate] Updates to XM hardware Ethernet port interface MAC address assignment (fixed in 3.2.1)
13289	Invalid warning appears on web management interface when Subscriber Module Target Receive Level is configured above -60 dBm (fixed in 3.2.1)
13165	SM in NAT mode with Separate Management IP and Management VLAN is not accessible by Separate Management IP address (fixed in 3.2.1)
13228	Web management interface is not accessible after an upgrade attempt with invalid software archive. Workaround: reboot the device to regain management access.
13317	eDetect may not display interfering devices at lower received/detected power levels (fixed in 3.3)
13187	Upon configuration restore, a browser refresh is required to display updated parameter values (fixed in 3.2.1)
13274	[ePMP Elevate] ePMP Elevate subscriber may disconnect under load due to hardware limitations. This disconnect is followed by an immediate re-registration. (fixed in 3.2.2)
12791	[ePMP Elevate] XM devices: When downlink RSSI is stronger than -30 dBm, the web management interface incorrectly reports RSSI of 256 dBm and SNR as 0 dB (fixed in 3.2.1)
12919	[ePMP Elevate] Rocket™ M5 (XM and XW): The web management provides options for configuring the device in AP or ePTP mode. These modes are not supported by ePMP Elevate software and should not be utilized. (fixed in 3.2.1)
13332	On occasion, after upgrading an ePMP SM to Release 3.2, the SM's web management interface may display "Board still in reboot state" or the interface may not be accessible. Workaround: reboot or power cycle the SM. (fixed in 3.3)

Known problems or limitations (System Release 3.1)

Tracking	Description / Workaround
13220	Support for use of shift key to select multiple frequencies in the Scan List (fixed in 3.2.1)
13165	SM does not create static route for separate management interface (fixed in 3.2.1)

ePMP

Tracking	Description / Workaround
13117	ePMP 2000 device configured in SM mode reports incorrect AP frequency and does not register (fixed in 3.2.1)
12409	With rare occurrence, SM scans without registration
12709	ePMP 2000: Cannot factory default via power cycle sequence (fixed in 3.2.1)
12792	Throughput Chart: Upon changing Throughput Measurement Period, control points (hover targets) not shown (fixed in 3.2.1)
12837	With certain configurations, GPS-synched software can be loaded onto Force 200 module
12878	ePMP device reboots twice after factory default

Known problems or limitations (System Release 3.0.1)

Tracking	Description / Workaround
12385	ePMP web management interface test tool Ping (Tools > Ping) does not execute with maximum buffer size (65507)
12439	ePMP devices with saved cnMaestro credentials which are not on-boarded by cnMaestro for more than 12 hours will stay in state "Device Approval Pending"
12513	Transmitter Output Power reference tables duplicated in web management interface notification

Known problems or limitations (System Release 3.0)

Tracking	Description / Workaround
12794	False radar detection on DFS channel FCC1322 Type1 22 (fixed in 3.2.1)
12793	False radar detection on DFS channel FCC1322 Type1 24 (fixed in 3.2.1)
12125	When in ETSI region and 5.4 GHz band using LBT, if the SM is subjected to very high interference, it may cause a reboot with a crash signature "arqtx_rwb_from_wbuf".
11973	The "Internet" Globe icon on the top right of the GUI page may take up to 40 seconds to turn green once a DNS server has responded.
11491	When ePMP 2000 is in Standard WiFi, a Ubiquiti Nanobeam may not register. There is currently no workaround.
11406	When using 5 MHz channels on ePMP 2000 in TDD mode, TCP downlink throughput may degrade by up to 20%.

Known problems or limitations (System Release 2.6.2)

Tracking	Description / Workaround
11978	When there are more than 128 entries into the Bridge Table, the table may display as an empty table.

Known problems or limitations (System Release 2.6)

Tracking	Description / Workaround
10907	When in AP WiFi mode and the SM connected is an 802.11a SM, the downlink throughput can be lower by 20%. (fixed in 3.3)
10704	When editing the MAC Addresses entries in the Wireless MAC Filtering table using the configuration file upload, care must be taken to ensure MAC address format integrity. The ePMP device will not validate the format.

ePMP

Known problems or limitations (System Release 2.4.3)

Tracking	Description / Workaround
9951	On occasion, pings are lost when continuously pinging the SM from the AP. The ping loss can occur for a period of 30-60 seconds before it operates normally. User traffic may also be lost during this time and a reboot of the SM may be required to recover the SM.

Known problems or limitations (System Release 2.4)

Tracking	Description / Workaround
8198	On occasion, stale ARP entries are not cleared from the ARP table (under Monitor>network) on the SM. The entries should be cleared in 5 minutes but it may take up to 10 minutes for them to be cleared.

Technical Support

For technical support, see

http://www.cambiumnetworks.com/support/

Cambium Networks Community Forum

Join the conversation

http://community.cambiumnetworks.com/

Exhibit F

Partial Transcription of November 30, 2016 ePMP Elevate Webinar

* Webinar may be accessed either at (1) https://www.youtube.com/watch?v=UCxpPmXtp-8 or (2) http://community.cambiumnetworks.com/t5/ePMP-Elevate/ePMP-Elevate-webinar-replay/m-p/62777.

[Note: Times refer to webinar presentation time]

1:20 – 1:35 – "This is Sakid Ahmed speaking, along with me we have we have Alex Marchum who is the Product Manager of the ePMP program. Dmitry Moiseev, he is a system architecture engineer and a system architect engineer, principal engineer with the ePMP team."

2:26 – Displays slide showing use with Ubiquiti.

3:04 – 3:28 – "Offer a backwards compatibility or interoperability mode for existing subscriber modules that are potentially not Cambium are based on 802.11 n-base subscribers and build a virtual ePMP system where some subscribers are of a different flavor sitting alongside Cambium native ePMP subscribers."

3:35 – Webinar Slide:

- Allows **ePMP Elevate** software to run on **non-Cambium Networks 802.11n-based** subscriber models
- **ePMP Elevate** subscribers function **as ePMP** subscribers – with all the ePMP benefits
- Comparable performance to all-**ePMP** networks, despite different subscriber hardware; industry-first **hardware-agnostic networks**

  (Emphasis in original.)

3:39 – 3:52 – "So, with the combination of ePMP and other third party hardware in the same network, this is what we're referring to as the first hardware-agnostic, network solution in the WISP [wireless Internet service provider] industry today."

4:30 – 4:46 – "Many WISPs have existing deployed infrastructure, significant number of subscriber modules from other vendors that are very expensive to replace. So the network, hardware migration still remains very challenging for WISPs today."

4:33 – Webinar Slide (Portion):

- But many WISPs have older deployed gear
  – Network hardware migration remains challenging

4:48 – Webinar Slide:

- Why is network hardware migration **hard?**
  – Cost of **new hardware**
  – **Installation cost** – truck rolls
  – **Customer satisfaction** impact
    - Service credits
    - Arranging installations where indoor access required
    - Downtime and teething troubles

  (Emphasis in original.)

8:17 – Webinar Slide (Portion):

- **ePMP Elevate** is the only solution offering a pain-free network migration path to the next level:
    - Frequency re-use enabled by **GPS Synchronization**
    - **Smart Beamforming** and **Intelligent Filtering**
    - All **without** changing subscriber hardware

(Emphasis in original.)

8:58 – 9:11 – "Take your existing hardware that has been stagnant . . . and [have] new life breathed into it with ePMP elevate."

11:35 – Webinar Slide:

- **ePMP Elevate** is first available in **Release 3.2**
- **Release 3.2** consists of:
    - **5 GHz** support only
    - XW-based Ubiquiti hardware (2013 – current)
    - XM-based Ubiquiti hardware (2013 and prior)
    - 17 supported models

11:48 – 12:00 – "We will support XW firmware-based Ubiquiti hardware from 2013-current XM-based Ubiquiti hardware from 2013 and prior, which totals 17 support models today."

12:20 – Webinar Slide:

- **ePMP Elevate** will continue to be developed
- Some future identified items are:
    - **Mikrotik** support
    - Support for more Ubiquiti subscriber modules
    - **2.4 GHz** support

(Emphasis in original.)

12:25 – 12:27 – Goal for future is "support for greater number of Ubiquiti subscriber models."

13:01 – Webinar Slide:

- Lists pricing: ePMP Elevate: 1 Subscriber License $35 (MSRP) (USD)

15:15 – "Live upgrade of a [third party subscriber] unit" (demonstrated by Dmitry Moiseev)

15:53 – 16:14 – "In web browser, you can see the well-known model from Ubiquiti . . . running XW Firmware. What I'm going to do, I'm going just to update it through the regular web update procedure."

18:11– 18:20 – (Video of Ubiquiti Units) "What you see are ePMP 1000 generation subscribers as well as some Ubiquiti subscriber units connected and passing traffic."

21:44 – 21:53 – "Warranty is specific to hardware. ePMP Elevate is a software solution so therefore any hardware specific defects should be reported to the corresponding manufacturer."

25:24 – 25:47 – "Will we be able to use a former Ubiquiti SM and DMS channels? . . . Yes, we will be able to. . . Ubiquiti hardware is DMS approved and it will be available."

27:07 – 27:15 – "ePMP Elevate solution does not, and I repeat does not replace the plans you have to install new hardware."

29:42 – 29:54 – "If issue with hardware unit, is it Cambium support issue or Ubiquiti support issue? . . . If it is hardware problem, that is responsibility of hardware manufacturer."

36:52 – 37:17 – "If you upgrade a subscriber module to ePMP Elevate, you are always able to revert back to the original manufacturer's software . . . support same hardware reset functionality on all those units and you can always return back to the original manufacture's software if you so desire. And that answers the question whether the upgrade step is reversible so we won't go through that again."

38:25 – 38:30 – "Is there any possibility of Ubiquiti blocking the ability to allow third-party firmware? Absolutely, there is."

41:29 – Screenshot of Cambium Networks User Interface displaying NanoBeam-M5 with Cambium Networks copyright notice.

47:53 – 47:58 – "Is upgrade reversible and can you move back to Ubiquiti?. . . . Yes, you can."

48:28 – 48:35 – "Once again warranties are hardware specific so therefore any hardware failures should be referred to the manufacturer."

49:56 – 50:03 – "Once you've uploaded ePMP Elevate . . . old manufacturers' firmware is not operating in any form."

Exhibit G

ePMP Elevate

Increase performance without replacing installed hardware.

ePMP Elevate is an innovative software solution that empowers 3rd party subscriber hardware with all the performance and scalability benefits of the ePMP platform, when co-installed with an ePMP access point.

Where to Buy

Contact

Get Quote

PMP Distribution

Don't replace your hardware. Elevate it.

Transform your network

ePMP Elevate software solution allows fixed wireless broadband networks to gain the powerful signature capabilities of Cambium Networks' ePMP platform, including frequency reuse enabled by GPS Synchronization and Smart Beamforming, even on non-Cambium 802.11n-based hardware.

The next level of network migration

Saving the cost and time of a total network replacement, an operator simply installs an ePMP Access Point and loads ePMP Elevate software onto their deployed subscriber modules.

Protected investment

With the upgraded features of ePMP Elevate, the life of existing infrastructure is dramatically extended to support revenue-generating applications for years to come.

Contact

Get Quote
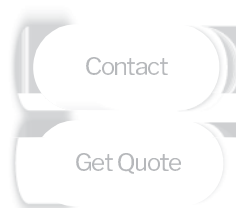
Streamlined operations

ePMP Elevate networks can be managed by cnMaestro™, the cloud-based or on-premise platform that provides end-to-end management, device onboarding, and maintenance support for wireless broadband networks from a single, easy-to-use interface.

Managing all your Wireless Devices Effortlessly

See a view from the clouds

With ease of use and vast scalability, cnMaestro has a full set of features targeted to cloud manage Cambium devices in a simple way.

Try cnMaestro Now

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Get Quote
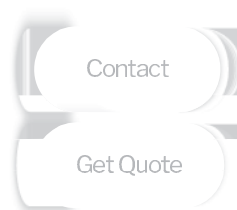
ADDITIONAL RESOURCES

Accessories, including power supplies and antennas

Software downloads and documentation

ePMP Consultants

Community discussion

Technical Training

Recorded Webinars

STAY CONNECTED

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Exhibit H

Cambium Networks

ROLLING MEADOWS, IL, November 30, 2016 — Cambium Networks, a leading global provider of wireless networking solutions, today announced ePMP™ Elevate, a software solution allowing outdoor wireless broadband networks to gain the powerful signature capabilities of Cambium Networks' ePMP platform, including frequency reuse enabled by GPS Synchronization and Smart Beamforming, even on non-Cambium Networks 802.11n-based hardware. With ePMP Elevate, operators can bring industry-leading performance and scalability to existing infrastructure without the time and cost of replacing network equipment.

As it becomes increasingly important for wireless network operators to keep up with customer demands, the cost and time of traditional network migration methods can be major pain points. The launch of ePMP Elevate takes network migration to the next level, solving the challenges of traditional network migration methods at a fraction of the cost and time. Network operators simply need a single ePMP access point and to load their deployed subscriber modules with ePMP Elevate software. Their hardware investment is protected, and their existing infrastructure is given a new lease on life to support revenue-generating applications for years to come. Additionally, network operators are able to confidently extend high-speed connectivity and increase density to meet customer demand without the time and expense of dispatching technicians to each subscriber location.

"For years we have operated by limiting ourselves to no more than 25 subscribers per AP without seeing a rapid decline in overall AP performance," said Ian Ellison, CTO, WISPER Internet and Co-Owner of BLIP Networks. "Through prior testing and deployment with ePMP, we knew that GPS synchronization would improve our network stability and spectral efficiency, but we had an equipment and labor investment in the installed base. ePMP Elevate allowed us to achieve synchronization and frequency re-use across our entire network by just replacing the APs. It's affordable, improves network performance, boosts customer satisfaction, and most importantly allowed us to upgrade our infrastructure without costly truck rolls to replace customer equipment."

"ePMP Elevate is a software solution that is hardware agnostic," said Atul Bhatnagar, President and CEO of Cambium Networks. "Network operators with radio hardware from one or multiple vendors can now operate one network with a common management system without replacing installed CPE hardware."

"Wireless broadband network operators around the world have been asking for this," said Sakid Ahmed, Vice President, ePMP Business, at Cambium Networks. "Many started out years ago with small networks, but as demand for connectivity has grown, their existing networks cannot effectively scale. ePMP Elevate adds critical features to their 802.11n-based installed equipment and positions them for growth and increased customer satisfaction."

ePMP Elevate networks can be managed by cnMaestro. This cloud-based or on-premise platform provides end-to-end management, device onboarding, and maintenance support for wireless broadband networks from a single, easy-to-use interface.

Cambium Networks is hosting a free webinar on ePMP Elevate to present the features, benefits, share actual field performance, and discuss deployment strategies. The webinar will be held on Wednesday, November 30, at 9:00 a.m. US CST.

About Cambium Networks:

Cambium Networks is a leading global provider of trusted wireless solutions that connect the unconnected – People, Places and Things. Through its extensive portfolio of reliable, scalable and secure wireless narrowband and broadband platforms, Cambium Networks makes it possible for all service providers and industrial, enterprise and government network operators to build affordable, reliable, high-performance connectivity. The company currently has over six million radios deployed in thousands of demanding networks in more than 150 countries. Headquartered outside Chicago and with R&D centers in the U.S., U.K. and India, Cambium Networks sells through a range of trusted global distributors.

For more information, visit www.cambiumnetworks.com and www.connectingtheunconnected.org.

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Exhibit I

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Cambium Networks' Wireless Fabric

cnMAESTRO

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LINKPlanner
- Free, network design tool for RF environments
- Tens of thousands of links deployed

cnMaestro
- Cloud management
- Secure, end-to-end network control

cnArcher
- Free android app
- Allows field techs to configure PMP networks

Point-to-Point

PTP 650/670
- Launched in November 2013/2017
- Replacement for legacy PTP 600 which was the "gold standard" for almost a decade

PTP 550
- Launched January 2018
- Exceptional headline data rate (1.4 Gbps)

Point-to-Multipoint

cnMedusa (PMP 450m)
- Launched in September 2016
- Breakthrough 14x14 Massive MU-MIMO
- Will drive continued PMP growth for next several years

PMP 450i
- Launched in September 2012/2016
- Long awaited replacement to flagship PMP product line
- Top performing Cambium product

ePMP

ePMP 1000/2000
- Launched in October 2013
- High quality, affordable platform

ePMP 3000
- Launching December Q2 2018
- 4x4 MU-MIMO & 80 MHz Channel Support
- Higher Capacity and Spectral Efficiency

Wi-Fi

cnPilot e4/5/6xx
- Launched in July 2015, cloud-savvy
- Affordable yet uncompromising quality

cnPilot e430W
- Launching Q1 2018
- Wall Plate AP for Hospitality
- Managed Service Provider enaber

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cnPilot Wi-Fi Portfolio Overview

Provide seamless indoor and outdoor Wi-Fi with field proven solutions that meet capacity needs.

	r190W	r190V	e410	e600	e500	e430W
Key Statement	Indoor residential and small to medium business Wi-Fi access		Enterprise indoor access points		Enterprise outdoor access point with options for antenna coverage: • E500 - omnidirectional • e501S - 90° - 120° • e502S - 30°	Enterprise wall plate
Typical Application	Indoor Wi-Fi coverage • Residential • Small and medium business		Enterprise Wi-Fi coverage for indoor locations: • Enterprise • Hospitality • Industry • Public Wi-Fi • Retail		Wi-Fi coverage for outdoor areas • Enterprise • Hospitality • Industry • Public Wi-Fi	Hospitality
Wi-Fi Standard	802.11n	802.11n	802.11ac Wave 2	802.11ac Wave 2	802.11ac	802.11ac Wave 2
Frequency			2.4 and 5 GHz	2.4 and 5 GHz	2.4 and 5 GHz	2.4 AND 5 GHz
Max Throughput	300 Mbps	300 Mbps	867 Mbps	1.3 Gbps	1.01 Gbps	1.01 Gbps
Tx Power	24 dBm	24 dBm	24 dBm at 2.4 GHz 25 dBm at 5 GHz	24 dBm at 2.4 GHz 28 dBm at 5 GHz	29 dBm at 2.4 GHz 28 dBm at 5 GHz	22 dBm at 2.4 GHz 21 dBm at 5 GHz
Concurrent Users	64	64	256	512	256	256
SSID	4	4	16	16	16	16
Mesh Capability	No	No	Yes	Yes	Yes	Yes
Ethernet ports	4 LAN 1 WAN	4 LAN 1 WAN	1 LAN	2 LAN	2 LAN	3 LAN 1 LAN + PoE
Roaming	No	No	Yes	Yes	Yes	Yes

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PMP 450 Platform Overview

Access Points

Subscriber Modules

	450m cnMedusa	450i	450	450b	450i	450
Frequency Bands	3 GHz*, 5 GHz	900 MHz, 3 GHz, 5 GHz	2.4 GHz	3 GHz*, 5 GHz	3 GHz, 5 GHz	900 MHz, 2.4 GHz
Channel Size	5|7|10|15|20|30|40 MHz	5|7|10|15|20|30|40 MHz	5|10|15|20|30|40 MHz	5|7|10|15|20|30|40 MHz	5|7|10|15|20|30|40 MHz	5|7|10|15|20|30|40 MHz
Physical Layer	14 x 14 MU-MIMO / OFDM	2 x 2 MIMO / OFDM	2 x 2 MIMO / OFDM	2 x 2 MIMO / OFDM	2 x 2 MIMO / OFDM	2 x 2 MIMO / OFDM
Interface	Gigabit, SFP; 2nd Ethernet port PoE out	Gigabit; 2nd Ethernet port PoE out	100 Mbit	Gigabit	Gigabit; 2nd Ethernet port PoE out	100 Mbit
Environmental	IP 67, IP 66	IP 67, IP 66	IP 67, IP 66	IP 55 (Mid-gain), IP 67 (High Gain)	IP 67, IP 66	IP 55
Latency	7-10 ms	3-5 ms	3-5 ms	3-5 ms	3-5 ms	3-5 ms
Performance	1.2 Gbps+	300+ Mbps	200+ Mbps	300+ Mbps	300+ Mbps	100+ Mbps
Powering Methods	56V PoE; Cambium Proprietary	30V PoE; 802.3af; Cambium Proprietary Standard PoE Pinouts	30V PoE; Cambium Proprietary Standard PoE Pinouts	30V PoE; Cambium Proprietary Standard PoE Pinouts	30V PoE; Cambium Proprietary Standard PoE Pinouts	30V PoE; Cambium Proprietary Standard PoE Pinouts
Power Consumption	85 W Max, 70 W Typical	19 W Max, 16 W Typical	15 W max, 12 W typical	12 W max, 9 W typical	19 W max, 16 W typical	12 W max, 9 W typical
Max Power	+42 dBm EIRP	+44 dBm EIRP; +27 dBm Tx Power	+22 dBm Tx Power	+44 dBm EIRP (mid-gain); +51 dBm EIRP (High gain)	+50 dBm EIRP; +27 dBm Tx Power	+22 dBm Tx Power
Antenna	90°/120° Sector	90°/120° Sector: 17 dBi; Connectorized or external 60° Sector Antenna (900 MHz)	Connectorized or external 60° Sector Antenna	17 dBi: Mid-Gain; 24 dBi: High Gain (5 GHz); 19 dBi: High Gain (3 GHz)*	23 dBi (5 GHz); 19 dBi (3 GHz); Integrated Flat Panel	9 dBi: Integrated (2.4 GHz); Connectorized or external 12 dBi Yagi (900 MHz)
SMs Supported Per Sector	238	238	238			

PMP 450 Portfolio Overview 01112018

Access Points: 3 GHz 450i, 5 GHz 450i, 450m, 450i Connectorized, PMP 450 AP, 900 AP with Sector, PMP 450i 900 MHz, 900 SM with Yagi

Subscriber Modules: 450b Mid-gain, 450b High Gain, 450i Integrated, 450i Connectorized, 450 SM Integrated, 450 SM with Reflector Dish

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ePMP™ Portfolio Overview

	ePMP 1000 — 2.4 GHz — Connectorized | Integrated	ePMP 1000 — 5 GHz — GPS Sync Radio	ePMP 1000 — Bridge-in-a-Box	Force 180	Force 190	Force 200 — 5 GHz	ePMP 2000 5 GHz — Access Point with Intelligent Filtering and Sync	Force 300-16 / Force 300-25 / CSM 300 — Access Point with Intelligent Filtering	ePMP 3000 5 GHz — Access Point with MU-MIMO
Frequency Band(s)	2.4 GHz, 5 GHz; 2.4/2.5 GHz (Brazil, NZ); 6.4 GHz (Russia)	2.4 GHz, 5 GHz	5 GHz	5 GHz	5 GHz	2.4 GHz, 5 GHz	solution with beam steering, intelligent 5 GHz	5 GHz	5 GHz
Channel Size	5|10|20|40 MHz	5|10|20|40 MHz	5|10|20|40 MHz	5|10|20|40 MHz	5|10|20|40 MHz	5|10|20|40 MHz	5|10|20|40 MHz	20 | 40 | 80 MHz	20 | 40 | 80 MHz
Physical Layer	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11n – 64QAM	2 x 2 MIMO / OFDM 802.11ac Wave 2 256QAM	4 x 4 MIMO / OFDM 802.11ac Wave 2 256QAM
Interface	100 Mbit 2nd Ethernet port PoE out	Gigabit	Gigabit	Gigabit	100 Mbit	Gigabit	Gigabit	Gigabit	Gigabit/SFP
Environmental	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Latency	15–17ms	5–7ms	15–17ms	5–7ms	2–3ms	2~3ms	5–7ms	5–7ms	5–7ms
Performance	200+ Mbps	200+ Mbps	200+ Mbps	200+ Mbps	200+ Mbps	200+ Mbps	200+ Mbps	600+ Mbps	1+ Gbps
Powering Methods	30V PoE Cambium Proprietary	30V PoE 802.3af	30V PoE Cambium Proprietary Standard PoE Pinouts	30V PoE Cambium Proprietary Standard PoE Pinouts	30V PoE Cambium Proprietary Standard PoE Pinouts	30V PoE Cambium Proprietary Standard PoE Pinouts	56V PoE 802.3at	30V PoE	56V PoE 802.3at
Power Consumption	7 W max, 5 W typical	10 W max, 7.5 W typical	10 W max, 5 W typical	10 W max, 5 W typical	8 W max, 5 W typical	10 W max, 5 W typical	20 W max	12 W	21 W max
Max Tx Power	+30 dBm	+30 dBm	+30 dBm	+30 dBm	+27 dBm	+30 dBm	+30 dBm	+27 dBm	MCS0, VHT80: +25 dBm MCS9, VHT80: +21 dBm
Antenna	Integrated: 2.4 GHz – 11 dBi 5 GHz – 14 dBi Connectorized: 3rd party	90°/120° Sector: 18 dBi or 3rd party antenna	Integrated: 16 dBi	Integrated: 16 dBi	Dish: 22 dBi	Dish: 2.4 GHz - 17 dBi 5 GHz – 25 dBi	90/120° Sector: 17dBi Optional Beamforming	300-16: Integrated 16 dBi 300-25: Dish 25 dBi CSM 300: RP-SMA	90/120° Sector: 17 dBi 4 x 4 MU-MIMO Optional Beamforming
Modes	AP: 120 Subscribers SM PTP	AP: 120 Subscribers PTP	Bridge-in-a-Box: PTP	SM PTP	SM PTP	SM PTP	AP: 120 Subscribers PTP	SM PTP	AP: 120 Subscribers PTP

GPS Sync Radio — Connectorized — Integrated — Force 200 (2.4 GHz)

GPS Sync Radio — Connectorized — Bridge-in-a-Box — Force 180 — Force 190 — Force 200 (5 GHz)

Access Point with Intelligent Filtering and Sync (ePMP 2000 5 GHz)

CSM 300 (Q2/18) — Force 300-16 (Q2/18) — Force 300-25 (Q4/17) — Access Point with MU-MIMO (Q2/18)

Cambium Networks
www.cambiumnetworks.com

ePMP elevate

Leverage an existing 802.11-based installed network and add synchronization without the cost of replacing the entire network

ePMP 2000
2.4 & 5 GHz

Access Point with Intelligent Filtering and Sync

	Access Point with Intelligent Filtering *Industry's most affordable filtering and all the benefits of GPS sync*
Frequency Band(s)	2.4 & 5 GHz
Channel Size	5|10|20|40 MHz
Physical Layer	2 x 2 MIMO / OFDM 802.11n – 64QAM
Interface	Gigabit
Performance	200+ Mbps
Powering Methods	56V PoE 802.3at
Power Consumption	20 W max
Max Tx Power	+30 dBm
Antenna	90/120° Sector: 17dBi Optional Beamforming 3rd party horn
Modes	**AP**: 120 Max Subscribers GPS synchronized **PTP** Scheduling: ePTP	TDD	Flexible

ePMP elevate

Typical Application	Saving the cost and time of a total network replacement, an operator simply installs an ePMP Access Point and loads ePMP Elevate software onto their deployed subscriber modules.
Products Supported	• For Ubiquiti® XW/XM and Mikrotik SXT5-Lite Devices

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cnReach / IIoT Overview

Simplify the migration to an all-IP network and maximize the use of spectrum while reducing operating costs

	N500 900 MHz	N500 700 MHz	N500 450 MHz	N500 220 MHz	N500 I/O Expander
Key Statement	For outdoor critical infrastructure operations, cnReach transports process monitoring and control data from the remote sensor or PLC/RTU back to the operations center supporting real-time automated decision making and on-going analytics. Covering large geographic areas, hard to reach terrain and challenging spectrum environments, cnReach delivers reliable, secure connectivity to the petrochemical, electric utility, water/wastewater/stormwater, rail and transportation industries. cnReach eases the migration to modern networks by combining legacy serial and analog/digital I/O with TCP/IP and Ethernet connectivity.				
Region	NA/CALA/Australia/NZ	US	Global	US	Global
Frequency Bands	ISM mode: 902 - 928 MHz; (915-928 MHz in Australia) MAS mode: 928 - 960 MHz	757-758 MHz and 787-788 MHz	406 – 430 MHz and 450 – 470 MHz	217 – 222 MHz	
Channel Size	ISM: 76 / 154 / 207 / 310 / 600 / 1200 kHz MAS: 12.5 / 25 / 50 kHz	12.5, 25, 50, 100, 200, 250 kHz	12.5 / 25 kHz (50 / 100 kHz available regulations permitting)	12.5 / 15 / 25 / 50 / 100 / 200 kHz	
Modulations	MSK / 2FSK / BPSK / QPSK / 8PSK / 16PSK / 16QAM / 32QAM	MSK / QPSK / 8PSK / 16QAM / 32QAM	MSK / QPSK / 8PSK / 16QAM / 32QAM	MSK / QPSK / 8PSK / 16QAM / 32QAM	
Max Tx Power	Up to 1 W (30 dBm) (ISM) Up to 4 W (36 dBm) (MAS)	Up to 10W (40 dBm)	FCC: 406.1 - 430 MHz (up to 2 W / 33 dBm); 450-470 MHz (up to 8 W / 39 dBm); ETSI: Up to 8W (39 dBm)	217-220: Up to 2W 220-222 Up to 5W	
Adaptive modulation	Yes	Yes	Yes	Yes	
Security	128/256-bit AES encryption and secure management interfaces (HTTPS, SNMPv3)				
Interfaces	Two Ethernet Two Serial (RS-232/422/485) Optional Analog/Digital GPIO	Two Ethernet Two Serial (RS-232/422/485) Optional Analog/Digital GPIO	Two Ethernet Two Serial (RS-232/422/485) Optional Analog/Digital GPIO	Two Ethernet Two Serial (RS-232/422/485) Optional Analog/Digital GPIO	Two Ethernet Two Serial (RS-232/422/485) Analog/Digital GPIO
LINKPlanner	Y	Y	Y	Y	
cnMaestro	Y	Y	Y	Y	

Cambium Networks offers a complete set of accessories for cnReach including power supplies, antennas and adaptors.

Cambium Networks
www.cambiumnetworks.com

Licensed Microwave Overview

	FULL OUTDOOR		SPLIT MOUNT	
	PTP820S	**PTP820C**	**PTP820G + RFU-C**	**PTP820G + RFU-A**
Frequency Band	6 – 38 GHz	6 – 38 GHz	6 – 38 GHz	6, 11 GHz
Channel Size	3.5 - 80 MHz	3.5 - 80 MHz	3.5 - 60 MHz	3.5 - 60 MHz
Number of Carriers	Single	Dual	Single and Dual	Single and Dual
XPIC	Not Supported	Supported	Supported	Supported
MIMO	Not Supported	2x2 / 4x4 MIMO	Not Supported	Not Supported
Traffic Interface	1 x 10/100/1000 Base T (RJ 45)	1 x 10/100/1000 Base T (RJ 45)	4 x 10/100/1000 Base T (RJ 45)	4 x 10/100/1000 Base T (RJ 45)
	2 x 1000 BaseX - SFP	1 x 1000 BaseX - SFP	2 x 1000 BaseX - SFP	2 x 1000 BaseX - SFP
MTU	9600 Bytes	9600 Bytes	9600 Bytes	9600 Bytes
QoS,	VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP	VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP	VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP	VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP
	8 priority queues	8 priority queues	8 priority queues	8 priority queues
	configurable up to 64 Mbit per queue	configurable up to 64 Mbit per queue	configurable up to 64 Mbit per queue	configurable up to 64 Mbit per queue
Configuration	1+0	1+0 to 4+0	1+0 to 2+0	1+0 to 2+0
	1+1 HSB	1+1 / 2+2 HSB	1+1 / 2+2 HSB	1+1 / 2+2 HSB
	2+0, Non-XPIC	2+0 XPIC	2+0 XPIC	2+0 XPIC
		2+2 SD	1+1 HSB with SD	1+1 HSB with SD
Performance (Layer 2)	596 Mbps - No Compression	1.2 Gbps - No Compression	1 Gbps - No Compression	1 Gbps - No Compression
	833 - Multi-Layer Compression	2 Gbps - Multi-Layer Compression	2 Gbps - Multi-Layer Compression	2 Gbps - Multi-Layer Compression
Modulation	QPSK to 2048 OAM w/ACM	QPSK to 2048 OAM w/ACM	QPSK to 2048 OAM w/ACM	QPSK to 2048 OAM w/ACM
Multi Carrier Link Aggregation	N/A	MC-ABC	MC-ABC	MC-ABC
Power Consumption	6-11 GHz: 40W	6 & 11 GHz: 65W	IDU: 23.5W (single modem)	IDU: 23.5W (single modem)
		7 GHz: 75W	IDU: 26.4W (Dual modem)	IDU: 26.4W (Dual modem)
	13-38 GHz: 35W	13-15 GHz & 26-38 GHz: 55W	RFU-C 6-26 GHz: 22W (1+0), 39W (1+1)	RFU-Ae: 77W (1+0), 101W(1+1)
		18-24 GHz: 48W	RFU-C 28-38 GHz: 26W (1+0), 43W (1+1)	RFU-Aep: 90W (1+0), 114W(1+1)
Maximum Tx Power	29 dBm	28 dBm	26 dBm	35 dBm

Cambium Networks™
www.cambiumnetworks.com

Point to Point Sub 6 GHz: Product at a Glance

	Bridge-in-a-Box	F300-25	PTP 450	PTP 450i	PTP 550 (Dual Carrier)	PTP 670
Frequency Range (GHz)	4.9 to 5.97	5.15 to 5.97	3.5 /3.65/ 5.4 to 5.8 GHz	4.90 to 5.925	5.15 – 5.97	4.9 to 6.05
Channel BW (MHz)	5/10/20/40	20/40/80	5/10/20/30	5/10/15/20/30/40	2x 20/40/80	5/10/15/20/30/40/45
Technology	802.11n	802.11ac Wave 2	Proprietary	Proprietary	802.11ac Wave 2	Proprietary
Line of Sight	LoS	LoS	LoS	LoS	LoS	LoS, nLoS, NLoS
Environmental	IP55	IP55	IP55	IP66/67	IP66/67	IP66/67
Latency	3-6 ms	3-6 ms	3-5 ms	3-5 ms	3-5 ms	1-3 ms
Performance	200 Mbps	600 Mbps	300 Mbps	300 Mbps	1.4 Gbps	450 Mbps
Top Modulation	64 QAM	256 QAM	256 QAM	256 QAM	256 QAM	256 QAM
Max Frame Size	1700 Bytes	1700 Bytes	1700 Bytes	1700 Bytes	1700 Bytes	9600 Bytes
Spectrum Management	Standby Spectrum Analyzer	Live Spectrum Analyzer	Standby Spectrum Analyzer	Standby Spectrum Analyzer	Dynamic Channel Selection	Dynamic Spectrum Optimization (DSO)
Dynamic Filter	No	No	No	Yes	No	No
IEEE 1588v2 & SyncE	No	No	No	No	No	Yes
TDD Sync	No	No	Yes	Yes	Yes	Yes
Encryption	AES 128	AES 128	AES 128	AES 128	AES 128	AES 128/AES 256
QOS	3 Level	3 Level	2 Level	4 Level	3 Level	8 Levels
Power Consumption	7W	12 W	12 W	< 25 W	< 25 W	<30 W
Max Tx Power	30 dBm	27 dBm	22 dBm	27 dBm	27 dBm	27 dBm
Integrated Antenna	16 dBi	25 dBi or 16 dBi	14 dBi	23 dBi	23 dBi	23 dBi

Planning and Management Overview

LINKPlanner

Quickly design networks for optimal deployment and cost effectiveness with ease.

cnArcher

Raise the bar on installation accuracy with cnArcher™, the free Android app that gives field techs the information they need to configure and properly align Cambium Networks PMP wireless broadband subscriber modules.
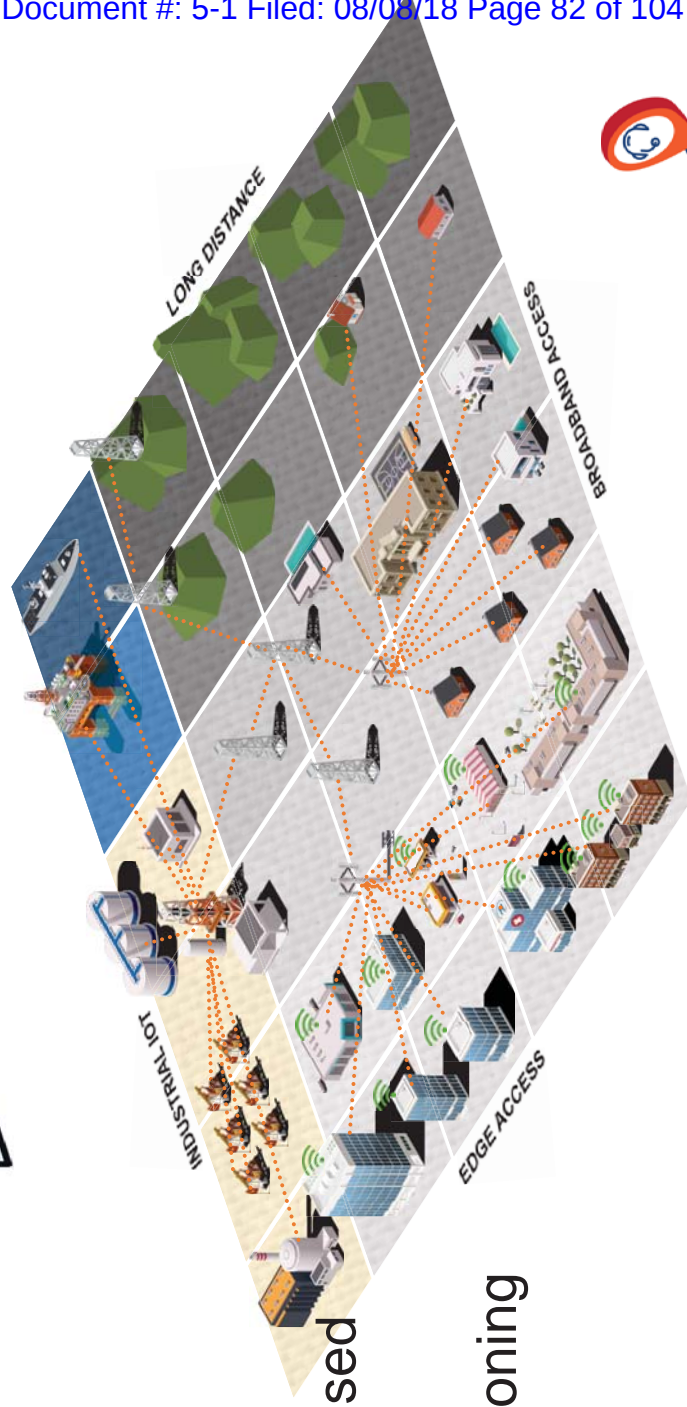
cnMaestro

cnMaestro™ is a cloud-based or on-premises software platform for secure, end to-end network control.

	LINKPlanner	cnArcher	cnMaestro
Typical Application	LINKPlanner allows you to model scenarios – based on geography, distance, antenna height, transmit power, and other factors – to optimize system performance before purchase. Quickly design networks for optimal deployment and cost effectiveness with ease. Available for Microsoft® Windows® and Mac® systems, LINKPlanner is a free, user-friendly link-design tool.	Designed with input from field technicians and years of experience on our millions of wireless broadband modules deployed, cnArcher validates configuration and alignment in seconds. Increase the number of installs done right the first time, and increase customer satisfaction. Eliminate problems, and focus your manpower on connecting new subscribers as your network grows.	cnMaestro wireless network manager simplifies device management by offering full network visibility. View and perform a full suite of wireless network management functions in real time. Optimize system availability, maximize throughput, and meet emerging needs of business and residential customers.
Products Supported	• cnPilot • ePMP • PMP • PTP • cnReach	• PMP	• cnPilot • ePMP • cnReach

Cambium Networks Wireless Network Fabric

- People Places Things
- Purpose Built
- 2m to 246km
- Kb to Mb to Gb
- Indoor and Outdoor
- PTP PMP Wi-Fi LTE
- Licensed and Unlicensed
- Scalable
- Concept to Commissioning
- Single Pane of Glass

GLOBAL SUPPORT

LONG DISTANCE

BROADBAND ACCESS

INDUSTRIAL IOT

EDGE ACCESS

cnMAESTRO

Cambium Networks™
www.cambiumnetworks.com

Resilient, Efficient, Affordable Wireless Connectivity Solutions

Exhibit J

PowerBeam™M5

MAIN | WIRELESS | NETWORK | ADVANCED | SERVICES | SYSTEM

Tools: ▲▼ | Logout

air OS™

airMAX Settings:

airMAX: [?] ☑ Enable

Long Range PtP Link Mode: [?] ☐

airSelect

airSelect: [?] ☐ Enable

airView

airView Port: [?] 18888

🖼 Launch airView [?]

Change

GENUINE PRODUCT

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Tools › Software Upgrade

Main Software

- ⓘ Hardware Version — ePMP Elevate NBE-M5-16-XW
- ⓘ Software Version — 3.2-RC12
- ⓘ Firmware Version — U-Boot 1.1.4-s958 (Jun 10 2015 - 10:56:20)

Upgrade Options — ○ URL ● Local File

Select File — Browse...

Upgrade

Sidebar

- Home
- Quick Start
- Configuration ▾
- Monitor ▾
- Tools ▾
  - Software Upgrade
  - Backup / Restore
  - eDetect
  - Spectrum Analyzer
  - eAlign
  - Wireless Link Test
  - Ping
  - Traceroute

Cambium Networks
ePMP 1000 Elevate

Subscriber Module

41:31 / 56:51

Exhibit K

Cam...

Help   Sign In

Cambium Networks Community   >   Forums   >   ePMP   >   ePMP Elevate

>   Issues elevating Ubiquiti devices with firmware higher than 5.6.15

Options
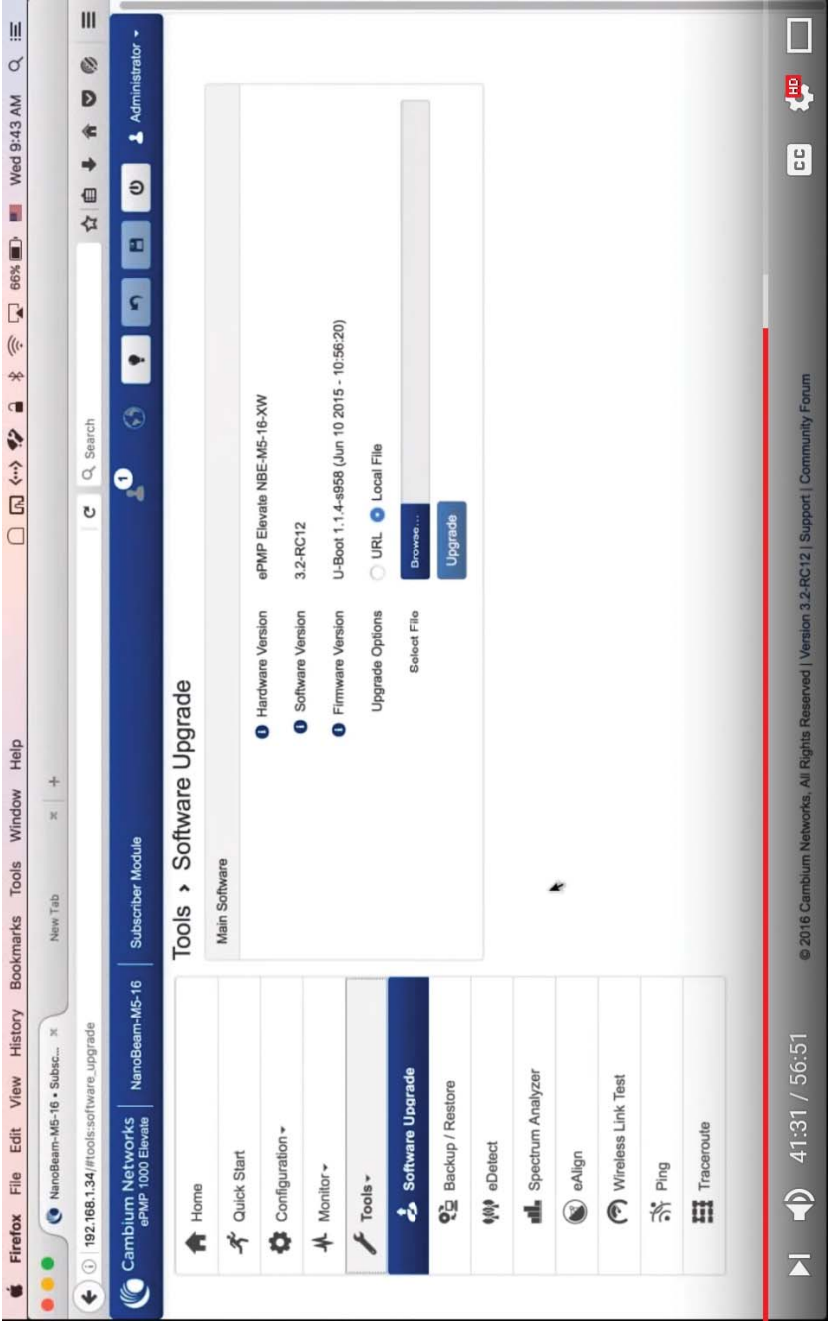
This board ▾   Search all content

cancel

Issues elevating Ubiquiti devices with firmware higher than 5.6.15

☑ SOLVED

⬇ Go to solution

georgehbb Occasional Contributor

10-06-2017 09

✔ **Issues elevating Ubiquiti devices with firmware higher than 5.6.15**

🔗

Hi Everyone,

We are trying to elevate some devices here in the office before we test them in the field.
We could easily elevate Nanostations 2.4, but we are having issues with the PowerBeams.
I made sure we were using the XW firmware, I did read a bunch of forum discussions about it. I also tried to use the **elevator tool** available at this link:
https://www.dropbox.com/sh/2ja5jwsids1p9k8/AAAFMn_Us8qlnMBaMbM5FFW

La?dl=0

Tried with different Elevate firmwares:

From XW 3.5 to XW 3.2

Unfortunately the Ubiquiti interface says:

> This firmware is not trusted by airOS. To maintain security, it will not be loaded. Please load trusted firmware.

I tried to upgrade the Powerbeam to 6.1.0 and downgrade it to 5.6.15 (the lowest firmware Ubiquiti would allow you to use) to no success.

Any suggestion? Thank you.

Solved! Go to Solution.

👍   0 Kudos   **Reply**

---

2 REPLIES

All forum topics   ‹ Previous Topic   Next Topic ›

🔵 CAMBIUM Luis Cambium Employee   10-06-2017 02

Re: Issues elevating PowerBeam 2.4 with firmware 5.6.15 🔗

Hello,

Please check this <u>thread</u> to see if it helps your situation.

Regards

👍 | **2 Kudos**   **Reply**

---

georgehbb Occasional Contributor

10-10-2017 09

☑ Re: Issues elevating PowerBeam 2.4 with firmware 5.6.15 🔗

I found the solution myself. I hope this will help others in my same situation.

The bottom line here is that AS OF NOW (please check the date of this post) you CANNOT downgrade a ubiquiti device to a firmware lower than 5.6.15.

In order to elevate a Ubiquiti device you need to have it (ideally) on 5.6.6

Some guy from Nepal shared some BETA firmware that allowes you to downgrade any device to 5.6.6
I put the file on this link <u>https://www.justbeamit.com/mz6rr</u>

Procedure: (works on both XM and XW)

1) Downgrade device to 6.0.6 beta

2) Downgrade to 6.0.4 (beta)

3) Downgrade to regular 5.6.6

4) Install elevate firmware (3.5 it's the most updated as of now)

Works like charm

You will be able to elevate any Nanostation or PowerBeam by following this procedure.

👍 **2 Kudos**   **Reply**

⬆ Top   powered by **Lithium**

Cam...

Cambium Networks Community   >   Forums   >   ePMP   >   ePMP Elevate

>   Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

Options

This board ⌄	Search all content

cancel

Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

jperez Occasional Contributor

07-10-2017 07

Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

the release notes of the new firmware looks like Ubiquiti trying to stop Elevate plans.

```
6.0.6 (XM/XW/TI) Changelog / July 5, 2017
====

New:
- Signed firmware support (Users are not able to downgrade below v6.0.6 unless
using TFTP)
- Upgrade libpcap to 1.8.1
- Additional statistics for AC2 agent
```

0 Kudos

Reply

5 REPLIES

All forum topics   ‹ Previous Topic   Next Topic ›

Chris_Bay Valued Contributor

07-10-2017 08

Re: Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

Figured they would at soms point.... im sure elivate took a lot of business from them.

0 Kudos

Reply

Eric Ozrelic Trusted Contributor

07-10-2017 11

Re: Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

There is a work-around at the moment... if you've already loaded 6.0.6 final onto a radio, you can load 6.0.6 beta, and then you can load 6.0.4 which will allow you to upload Elevate. You can find the beta HERE. You can find 6.0.4 HERE.

Please note that with 6.0.6 beta, UI firmware downgrades are restricted to 5.6.15, 6.0.3 and 6.0.4

👍 1 Kudo   Reply

---

mohannadda1996 New Member   07-21-2017 12

Re: Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

📎

I cant download beta version.......

📎 22312.jpg 161 KB

👍 0 Kudos   Reply

Mike99 Contributor

07-25-2017 10

Re: Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

> Chris_Bay wrote:
> im sure elivate took a lot of business from them.

The radio is already sold so it's hard to took buisness in this case but it could slow the old technology replacement. Anyway, N vs AC difference is not enough to worth changing gears but MU-MIMO could worth it.

0 Kudos

Reply

fgoldstein Contributor

07-25-2017 10

Re: Ubiquiti new firmware 6.0.6 is trying to put stop on Elevate plans?

To download the 6.0.6-beta, you first have to sign up for the beta program. Instructions on on UBNT's forums. They're giving that out as general advice, not just ot people who normally woudl try a beta.

0 Kudos

Reply

↑ Top

powered by **Lithium**

Exhibit L

5/23/2018　　Promotion - ePMP Elevate licenses for free !!! || Winncom Technologies

NEWS　EQUIPMENT　SOLUTIONS　RESOURCES　ABOUT COMPANY　CONTACTS

December 4, 2017 **Promotion - ePMP Elevate licenses for free !!!**

References

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About company
Contacts

news
Equipment
Solutions
Resources

Cambium Networks is launching a campaign to help owners of wireless networks built on Ubiquiti equipment to upgrade their network by replacing old equipment with the base station of the ePMP1000 or ePMP 2000 series. When purchasing new ePMP equipment, you get Elevate licenses as a gift !!!

EPMP Elevate is an inexpensive, easy and fast way to significantly increase the performance of an existing wireless broadband access network deployed on 802.11n equipment.

There is no need to replace the subscriber devices! You change only your old access point to the high-performance Cambium base station series ePMP1000 or ePMP2000!

When buying a base of 2.4 GHz or 5 GHz ePMP 1000 - 10 free licenses Elevate!
When buying a base 5 GHz ePMP 2000 Access Point (AP) - 20 free licenses Elevate!
When buying a base 5 GHz ePMP 2000 Access Point + sector antenna + bimforming antenna -
30 free Elevate licenses!

The promotion is valid until December 31, 2017!

More detailed information about the action is available on request, which can be sent by mail to sales@winncom.ru , or by leaving a message in the form of a feedback below:

Your name*

Your surname *

Company*

Your email *

Phone*

Question*

https://translate.googleusercontent.com/translate_f　　6/29/2018

НОВОСТИ	ОБОРУДОВАНИЕ	РЕШЕНИЯ	РЕСУРСЫ	О КОМПАНИИ	КОНТАКТЫ

4 Декабря 2017

Акция – лицензии ePMP Elevate бесплатно!!!

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Оборудование

Решения

Ресурсы

Компания Cambium Networks проводит акцию, призванную помочь владельцам беспроводных сетей, построенных на оборудовании Ubiquiti, модернизировать свою сеть, заменив старое оборудование на базовую станцию серий ePMP1000 или ePMP 2000. При покупке нового оборудования ePMP вы получаете лицензии Elevate в подарок!!!

Программа ePMP Elevate – недорогой, простой и быстрый способ значительного увеличения производительности существующей сети беспроводного широкополосного доступа, развернутой на оборудовании стандарта 802.11n.

При этом нет необходимости в замене абонентских устройств! Вы меняете только вашу старую точку доступа на высокопроизводительную базовую станцию Cambium серии ePMP1000 или ePMP2000!

- **При покупке базы 2.4 GHz or 5 GHz ePMP 1000 – 10 бесплатных лицензий Elevate!**
- **При покупке базы 5 GHz ePMP 2000 Access Point (AP) – 20 бесплатных лицензий Elevate!**
- **При покупке базы 5 GHz ePMP 2000 Access Point + секторная антенна + бимформинг антенна – 30 бесплатных лицензий Elevate!**

Акция действует до 31 декабря 2017 года!

Более подробная информация об акции предоставляется по запросу, который можно направить по почте на адрес sales@winncom.ru, или оставив сообщение в форме обратной связи ниже:

Ваше имя*

Ваша фамилия*

Компания*

Ваш email*

Телефон*

Вопрос*

☐ Я прочитал(а) и согласен(а) с Политикой конфиденциальности

Отправить